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A study of individual differences and ability grouping
in the junior high school.

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THESIS

A STUDY OF INDIVIDUAL DIFFERENCES
AND ABILITY GROUPING
IN THE JUNIOR HIGH SCHOOL

SUBMITTED BY

HUBERT ALOYSIUS McGRATH

(A. B. HOLY CROSS COLLEGE, 1925)

In partial fulfillment of requirements
for the degree of Master of Education

AUGUST 1934

First Reader: Jesse B. Davis, Professor of Education,
Boston University.

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Boston University.

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1918

LIST OF INDIVIDUALS
AND SOCIETY GROUPS
IN THE LIAISON HIGH SCHOOL

EDITED BY

HUBERT ALAN L. LORRAINE
(c. H. HOLY-CROSS COLLEGE, 1926)

In partial fulfillment of requirements
for the degree of Master of Education

1926

First Reader: Dr. E. L. LORRAINE, Professor of Education
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PREFACE

The purpose of this study is to examine the nature and extent of individual differences in the junior high school and the most commonly used method of providing for them; namely, homogeneous or ability grouping. The method of investigation has consisted partly in an original study of certain individual differences in a modern junior high school together with a survey of ability grouping practices in various junior high schools, but more largely of an analysis of the data made available by various investigators examining the individual differences of junior high school pupils and the technique of ability grouping.

An effort has been made to compare the results of these studies, in order to show, if possible, trends in the range and type of individual differences in our enlarged junior high school population resulting from the rapidly changing conditions of our social and economic life. In treating the question of ability grouping, the method consisted primarily in an examination of the more important of the recent studies dealing with this problem in the junior high school in order to discover the methods and practices that have been found most efficient and most sound from an educational standpoint in connection with the use of this plan as a means of recognizing individual differences.

PREFACE

The purpose of this study is to examine the nature and extent of individual differences in the junior high school and the most commonly used method of grouping for them; namely, homogeneous or ability grouping. The method of investigation has consisted partly in an original study of various individual differences in a modern junior high school together with a survey of ability grouping practices in various junior high schools, but more largely of an analysis of the data made available by various investigators examining the individual differences of junior high school pupils and the technique of ability grouping.

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CHAPTER I

INTRODUCTION

The problem of individual differences and their recognition is of paramount importance in the field of secondary education. The number of secondary school pupils has increased from 293,963 in 1890 to 4,399,422 in 1930. While only one pupil in ten of secondary school age was enrolled in the high school in 1890, in 1930, according to data furnished by the United States Office of Education, the number of pupils enrolled in the last four grades of the public school system was 47.2 per cent of all persons aged 15 to 18 years inclusive in the United States according to the census of 1930. If the enrollments in secondary departments of colleges and normal schools and in private high schools and academies are added to the public high school enrollments, the total registration in grades IX, X, XI, and XII was 51.5 per cent of the number of pupils who on the basis of age (i.e. 15 to 18 years inclusive) formed the potential secondary school population.¹

¹Biennial Survey of Education, 1928-30. U. S. Office of Education Bulletin (1931) No.20 Vol. II p.687-689.

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population.

The effect of this astounding increase upon the extent and variety of the individual differences of pupils is of deep significance to those interested in education. Thorndike² showed that in 1890, when only one child in ten of secondary school age entered high school, 95 per cent of these pupils were above the average in native intelligence, whereas in 1918, when approximately one child in three entered the high school only 83 per cent of them were above the average. That this percentage has decreased much further since 1918 is beyond question.

Nowhere has this problem of individual differences been more keenly felt than in the junior high school. Billet³ showed that from 1912 to 1930 the percentage of pupils enrolled in the first year of the high school has increased from 38 per cent of the enrollment in the seventh grade in 1912 to 80 per cent in 1930. From these figures it is probable that the number of pupils and, consequently, the range of individual differences in the junior high school grades has increased tremendously. The significance of this for the junior high school is marked. Num-

²Thorndike, Edward L. Changes in the Quality of Pupils Entering High School. School Review 30:355-359. May 1922.

³Billet, Roy O. Individual Differences, Marking, and Promotion. National Survey of Secondary Education Series Bulletin, 1932. No. 17. p.4

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bering among its special functions the recognition of individual differences and the retention of pupils, it can readily be seen that an increased obligation rests upon this organization to ascertain, as accurately as it can, the nature and extent of these differences and the most efficient means of recognizing them. Briggs states:

"Because of the variations in policy, the following principles are proposed for the intermediate school; first it should systematically seek to ascertain the nature and extent of individual differences of its pupils; second, it should definitely decide which of these from the point of view of public good it is reasonable to seek to reduce or destroy; third, it should adopt a definite policy as to providing education suitable to these differences which it cannot by any reasonable expenditure of effort and money hope to eradicate; fourth, it should recognize that as a public school it owes to each pupil a similar amount of attention regardless of differences of various kinds."

What is the nature and extent of the individual differences in the modern junior high school and how is their recognition being effected by the school? In Chapter III of this work a detailed study and comparison of the differences which have been found to exist among pupils attending the junior high school during the last decade will be made. This study will be carried out by means of an analysis of the literature dealing with this subject, especially the reports of investigations made to discover these differ-

⁴Briggs, Thomas L. The Junior High School. Houghton, Mifflin and Co. New York. 1920. p.136.

being among its special functions the recognition of individual differences and the retention of pupils, it can readily be seen that an increased obligation rests upon this organization to ascertain, as accurately as it can, the nature and extent of these differences and the most efficient means of recognizing them. Briggs states:

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Briggs, Thomas L. The Junior High School. Boston: Houghton Mifflin and Co. New York, 1920. p. 138.

ences, and by comparing such findings with those obtained by an investigation of the differences existing among the pupils of a typical modern junior high school. An examination of the various means by which junior high schools are seeking to provide for these differences will also be made and a comparison of the reports of earlier and later findings drawn in an effort to discover what tendencies are present and what practices are gaining greater recognition as the means of meeting this problem.

Perhaps the most pressing problem arising from the individual differences of pupils is that of the proper method of the recognition of the individual differences that exist among pupils in ability, i.e., in the ability to do the work of a given course. Several techniques are used in providing for these differences; homogeneous grouping, individual study plans, such as the Dalton and Winnetka plans, the Morrison plan, differentiated assignments, special classes, supervised study, and various others. In chapter IV, the writer will undertake to study the more important experiments dealing with the classification of pupils according to ability in the junior high school.

In presenting the results of this study no attempt has been made to justify the fundamental assumption underlying the adoption of ability grouping, namely, that differences in ability can be more adequately provided for in homogeneous

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In presenting the results of this study no attempt has been made to justify the fundamental assumption underlying the adoption of ability grouping, namely, that differences in ability can be more adequately provided for in homogeneous

than in heterogeneous groups. This fundamental problem is one that must be solved by more experienced minds in the field of education. Much has been said and many investigations have been undertaken in an attempt to furnish the solution. ⁵ Billet, ⁶ Turney, ⁷ and Douglas ⁸ have discussed the results of these studies at length. Their conclusions may best be summarized by the statement of Billet that "much controlled experimentation is necessary before the question is adequately answered."

However, as will be shown later, homogeneous or ability grouping is the most widely used means of providing for individual differences in the junior high school. It is, according to Billet, ⁹ "a procedure born of the necessities of a highly democratized system of education." Much experimentation has been undertaken to determine the most accurate method of classifying pupils into groups on the basis of ability. An examination of the more important experiments that have been carried out in the junior high school grades will be made with the purpose of determining which bases and meth-

⁵Billet, Roy O. op. cit. Part I, Chapter I.

⁶Turney, Austin H. "The Status of Ability Grouping." Educational Administration and Supervision 17:21-42 110-127. January-February 1931

⁷Douglass, Harl A. "Certain Aspects of the Problem of Where We Stand with Reference to the Practicability of Grouping." Journal of Educational Research 26:344-353. January 1933.

⁸Billet, Roy O. Op. cit. p.17.

⁹Billet, Roy O. Op. cit. p.16.

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⁵Billet, Roy O. op. cit. Part I, Chapter I.

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ods of classification have been found to classify pupils most accurately. From the available data, likewise, the reactions of teachers and pupils to the practice of ability grouping will be summarized and their general attitude toward it reported.

In Chapter II, the functions of the junior high school and their relative importance will be discussed as a consideration of these has an important bearing upon the extent and importance of this problem.

6

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CHAPTER II

THE FUNCTIONS OF THE JUNIOR HIGH SCHOOL

In common with the other units of the public school system, the junior high school has for its purpose the performance of various functions looking toward the realization of the aims and objectives of education. The main objectives of education have been well stated by the Commission on the Reorganization of Secondary Education of the National Education Association as follows: (1) health, (2) command of the fundamental processes, (3) worthy home membership, (4) vocation, (5) citizenship, (6) worthy use of leisure, (7) ethical character. An analysis of the many ways in which the junior high school fulfills these functions and the means this organization uses to attain these objectives is beyond the scope of this work.

Certain functions have been attributed to the junior high school by authorities on the subject as being particularly applicable to this unit of the school system in helping to realize the general aims of education. The junior high school is especially adapted to the performance of these functions, because in the reorganized school system

¹. Cardinal Principles of Secondary Education United States Bureau of Education Bulletin. No.35. 1918. pp.9-11.

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this unit has been planned with these functions particularly in mind. As a consequence, the grade organization, curricula, extra-curricula activities and other features of the junior high school are especially adapted to the carrying out of these functions. In the remainder of this chapter the more important of these functions and their bearing on the problem of individual differences will be discussed.

(a) The Functions of the Junior High School

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Koos made a survey of the available literature dealing with the junior high school with the aim of discovering the more common functions attributed to the new organization. Two types of literature were examined; (1) public school documents such as city school reports, pamphlets issued by the school authorities in description of the junior high schools established in their communities, and other similar materials usually prepared by the superintendent or principal, and (2) statements of the aims, advantages or functions of the junior high school by other educational leaders. The latter group of statements appeared in articles or editorials in educational periodicals, educational books, or reports of school surveys. The former were secured by means of a circular letter sent to the superintendents of systems reported as having introduced the junior high school or the 6-6 organization. The results of this survey show that certain functions

² Koos, Leonard V. The Junior High School. Ginn and Co. New York 1927. p.15

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called the democratizing functions, namely: retention of pupils, economy of time, recognition of individual differences, exploration and guidance, beginnings of vocational education, and the functions of recognizing the nature of the child at adolescence, providing the conditions for better teaching, securing better scholarship, improving the disciplinary situation and socializing opportunities have received the widest recognition in both classes of literature. Other functions such as effecting financial economy, relieving the building situation, continuing the influence of the home, hastening reform in grades above and below, normalizing the size of classes, and relieving teachers have less generally been claimed to be peculiar to the junior high school.

The first five functions enumerated above have been³ called the democratizing functions because, according to Koos, they contribute directly toward realizing a democratic school system. Education cannot be democratized, according to this writer, if pupils are to leave school as soon as the law permits. Furthermore, greater equalization of educational opportunities will be realized if more pupils are able to receive education of a secondary nature, and if individual differences are provided for by the school. Finally exploration and guidance, revealing to the pupil the direction in which his inter-

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ests and capacities may best be developed, with provision for a start in vocational training for those who probably will leave school early, are essential factors in bringing about a democratic school system.

⁴Briggs collected the definitions of the junior high school given by 68 leaders in the field of education, and calculated the number of items appearing in the various definitions and their frequency. The results of his tabulation show that the following are the most frequently mentioned as essential functions of this type of organization; Provisions for individual differences; departmental teaching; retention in school; differentiated curricula; economy of time; exploration of interests; attitudes and capacities; provisions for adolescence; provisions for social interests; pre-vocational training; educational guidance; vocational guidance; and flexible curricula. ⁵Davis has summarized the objectives or functions of the junior high as follows:

(1) To check the withdrawal of pupils from the seventh, eighth, and ninth grades by providing school work that is both more interesting and educationally more valuable than that offered by the traditional school and by organizing and administering this work through methods that are more in keeping with the natures of adolescent pupils than are methods commonly employed in the traditional elemen-

⁴Briggs, Thomas H. Op. Cit. p.15

⁵Davis, Calvin O. Junior High School Education, New York, World Book Co. 1924. p.102.

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⁴ Briggs, Thomas H. Co. Cit. p. 15.

⁵ Davis, Calvin G. Junior High School Education, New York, World Book Co. 1924. p. 103.

tary school and senior high school.

(2) To encourage and assist pupils to discover their own permanent interests, and their own reaches and limits of capacities, and their own best modes of self-expression and then to assist them to choose life careers in which (so far as enlightened human judgment is able to forecast) they can be most happy and contented and at the same time most socially effective and serviceable.

(3) To remove or at least to minimize the personal and social dangers which inhere in the instincts of adolescence and to convert raw potentialities into habits that make for good citizenship, workmanship, and sportmanship.

(4) To shorten the period of training for some few individuals who have before them a long course of systematic schooling, by permitting them to begin their differentiated education at an earlier period than has been customary in the past.

(5) To provide a truly realistic education for all youths between the ages of twelve and sixteen, and while adapting this training to individual needs and interests, so to administer it that each shall come to possess at least an appreciated knowledge of all the major activities of humanity and shall develop a tolerance and a sympathy for individuals outside his own social group.

(6) To interweave pre-vocational instruction and liberal culture so artfully that each shall have the effect of clarifying, deepening, and making truly significant and effective the elements of learning contributed by the other.

A comparison of the various items of these formulations reveals striking similarities. All three emphasize the importance of the functions of retention of pupils, economy of time, recognition of individual differences, exploration and guidance, beginnings of vocational education, provisions for the nature of the child at adolescence, departmental teaching, and improving the disciplinary situation and socializing opportunities. These have been called the basic functions of the

ary school and senior high school.
(2) To encourage and assist pupils to discover their own permanent interests, and their own resources and limits of capabilities, and their own best modes of self-expression and then to assist them to choose life careers in which (as far as enlightened human judgment is able to forecast) they can be most happy and contented and at the same time most socially effective and serviceable.

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(6) To intensify pre-vocational instruction and liberal culture so artistically that each shall have the effect of clarifying, deepening, and making truly significant and effective the elements of learning contributed by the other.

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junior high school since they are especially adapted to the newer form of organization and can be carried out only in the newer unit, or can be carried out better there than in either the elementary or high school.

(b) The Basic Functions of the Junior High School

1. Retention of Pupils

The need for a reorganization to reduce the elimination in the junior high school years has long been felt. ⁶ Inglis showed that the proportionate elimination in terms of the percentage of those in each grade who do not enter the succeeding grades is greatest between the ninth and tenth grade. The next largest proportionate elimination is between the eighth and ninth grades, and the seventh and eighth grades. The elimination above the ninth grade, that is, between any two succeeding grades above the ninth, is relatively inconsiderable.

Can the junior high school reduce this percentage of ⁷ elimination? Briggs states:

"That an institution which pupils enter before the law permits them to go to work and which offers them no convenient stopping point until the subjects of secondary education have been explored and have had a chance to make their appeal, an institution which provides in several ways for individual differences, and which affords attractive and profitable extra-curricula activities, is certainly likely to hold pupils longer than one that does none of these things."

Whether the junior high school has actually proved

⁶Inglis, Alexander J. Principles of Secondary Education. Houghton, Mifflin and Co. New York. 1918. p.118.

⁷Briggs, Thomas S. Op. cit. p.71

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"That an institution which pupils enter before the law permits them to go to work and which offers them no convenient stopping point until the subjects of secondary education have been explored and have had a chance to make their appeal, an institution which provides in several ways for individual differences, and which affords attractive and profitable extra-curricular activities, is certainly likely to hold pupils longer than one that does none of these things."

Whether the Junior high school has actually proved

Ingalls, Alexander J. Principles of Secondary Education.
Houghton, Mifflin and Co. New York, 1918. p. 118.
Briggs, Thomas B. Op. cit. p. 41.

its retaining power is not clearly evident though statistics would seem to indicate this to be the case. Improved economic conditions, social agencies outside the school, and other forces have so operated to extend the period of school attendance that it is difficult to determine whether they or the reorganized school system are responsible for the reduced⁸ elimination. The statistical studies that have been made, however, indicate that the latter is at least partly responsible.

(2) Economy of Time

To bring about a saving in time was one of the main reasons for establishing the new organization. The prevailing opinion was that too much time was spent in the seventh and eighth grades of the elementary school upon frequent and unnecessary reviews. This opinion was strengthened somewhat by a comparison of our system with various European systems, in which the secondary school period began about the sixth grade. The late President Eliot and his supporters urged a revision largely on this ground, since they felt that the young college graduates' professional education was begun too late due to the unnecessary delay in starting secondary school work.

Economy of time was thus originally conceived of as

⁸Koos, Leonard V. Op. cit pp. 21-28.

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the possibility of eliminating one or two years from the
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 secondary school period. Davis states the following:

"This notion, as has been shown, was notably strong at the outset of the reorganization movement. In the last few years, however, the idea has been submerged, if not wholly abandoned. It is a question whether the best interests of society and boys and girls can be secured by reducing the period of liberalizing education. It is possible that great benefits may be secured by enriching the program of studies and intensifying the training of pupils throughout the usual number of scholastic years."

Davis says further that the idea of a saving of time has not been entirely abandoned. That it has not been entirely abandoned may be seen from an examination of the
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 articles by Pickell, writing of the situation in the Cleveland junior high schools in which he advocates the acceleration of bright pupils by means of homogeneous
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 grouping, and by McCoy who states that by the same means and by beginning an elective in the seventh grade, two groups or one-fifth of the total number of pupils could have their junior high school training period cut to five semesters.

9. Davis, Calvin O. Op. cit. pg. 68

10. Pickell, Frank G. "Ability Grouping of Junior High School Pupils in Cleveland."
 Journal of Ed. Research 11: 244-53 April 1925.

11. McCoy, W. T. "Individual Differences in the Junior High School."
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Another conception of economy of time is that of enrichment, that is, of enriching the training program through a period of years of the same length as formerly, by depressing into lower years certain content formerly reserved for high school, or by introducing new and more vital content drawn from other sources. Koos¹² says that this concept is much more important than the first, and that it may be stated with some assurance that it cannot be abandoned.

(3) Recognition of Individual Differences.

The recognition of individual differences is one of the most important of the functions of the junior high school. Koos¹³ shows that in a comparison of the order of importance of the peculiar functions of the junior high, as determined by the average ranking of 124 judges, this function ranked first. That there exists wide variation among the pupils of the junior high schools is abundantly evident; it only remains to show the nature and extent of these differences. Briggs¹⁴ states that there are at early adolescence many kinds of individual differences, some due to nature and some to nurture. Briefly stated

12. Koos, Leonard V. Op. Cit. pg. 35

13. Koos, Leonard V. Op. Cit. pg. 117

14. Briggs, Thomas L. Op. Cit. pg. 135

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In the next chapter, the writer will present the results of a study of the individual differences of pupils in the junior high school grades and will attempt to show the extent and nature of the more important differences from an educational viewpoint.

While the fact of the existence of individual differences has been well understood, the problem of providing for them has proved a difficult one. Differentiated curricula have to a large extent solved this problem in the later years of the junior high school, but in the seventh grade particularly and in those subjects, such as English and social science, which are commonly taken by all pupils, the solution has not been so easy.

¹⁵
Koos lists (1) the expended differentiation of work through partially variable curricula, (2) promotion by subject, (3) permitting brighter pupils to carry more courses, (4) supervised study as the methods by which the junior high school can provide the proper recognition. To that may be added the various unit assignment plans, as

15. Koos, Leonard V. Op. Cit. pg. 50

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the Morrison, Dalton, and Winnetka plans, and the various forms of differentiated assignments. The particular plan or combination of plans best suited to solve this problem is a matter of much dispute. In chapter IV of this work, a study of homogeneous grouping, at present the most commonly used method of providing for individual differences, will be undertaken.

(4) Exploration and Guidance.

Guidance, both educational and vocational, was not originally conceived to equal in importance certain other functions of the junior high school. In recent years, however, the importance of this function has received more
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recognition. Davis states that:

"Of all the functions of the junior high school, that which seeks to aid pupils in discovering their own capacities and limitations, interests and distastes, powers and weaknesses, is in the judgment of the writer the most important. It is this function, above all others, that justifies the reorganization of schools on a new basis."

17

Glass an authority on this subject exemplifies the modern viewpoint. He states that the method of the junior high school is guidance, and upon its method more than upon its organization and objectives will depend its fullest progress. He continues:

16. Davis, Calvin O. Op. Cit. pg. 99

17. Glass, James M. "The Junior High School." The New Republic. Vol. XXXVI Part II No. 466 Nov. 7, 1923 Educational Section PP 20 - 21

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 17. Glass, James M. "The Junior High School." The New Republic. Vol. XXXVI Part II No. 468 Nov. 7, 1923
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"The junior high school has been variously entitled as the finding, the sorting, the trying out, and testing period of the public school system. It is a probationary period before the vital question of educational or vocational choice is finally determined. Explorations of individual differences, the revelation of educational and vocational opportunities, adapted to individual differences, guidance of educational or vocational choice, equalization of opportunities, the adaptation of educational offerings to ascertained individual needs rather than the conforming of pupils to one educational pattern, and the stimulation of educational or vocational vision which conditions all progress in secondary education, all these and other purposes to adapt the educational program to the individual are the objectives of the junior high school."

What means shall the school use to provide such
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exploration and guidance? Koos answers this question as follows:

"We shall need to have a thorough going organization in the grades under discussion, before we may canvass the child's abilities and interests satisfactorily or permit him to test them out. This purpose may not be accomplished without a much enriched and enlarged program of studies, including a wide range of academic and practical ~~arts~~ subjects, administered with the performance of this function, specifically in mind. Nor may we accomplish it without teachers who, being more in the nature of specialists in the lines they are teaching, have had more generous contacts with the world's work and the relations of their subject to it than have most of our elementary school teachers. With such a program and such teachers, it will be possible for the child to become acquainted, through participation and vicariously, with the chief

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departments of human knowledge and activity. By adding to these such features of school machinery as mental and vocational testing, a wide range of student activities and an adequate organization for guidance in the narrower sense, the enhanced possibilities for exploration and guidance in the junior high school become still more apparent. Although these and the kind of program referred to are not yet frequently introduced into schools so named, the movement is distinctly in that direction."

(5) Provision of the Beginnings of Vocational Education.

This function is dependent upon and is the natural
19
outcome of the function just discussed. Koos states that:

"Proper opportunities for exploration thus constitute, especially if the methods and processes of industry are illustrated, a sort of general vocational education, which is the by-product of the achievement of another important function. This measure of vocational education meets with little or no objection."

The original conception of this function, however, was that it would afford specialized training for those pupils who
20
would leave school at the ages of 14 or 16. Briggs says that:

"As shown elsewhere, there is widespread approval of specific trade training in American junior high schools for pupils, especially those over-aged who cannot be retained by any other means and who have determined on an early entrance to wage-earning."

19. Koos, Leonard V. Op. Cit. pg. 58

20. Briggs, Thomas L. Op. Cit. pg. 41

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This original conception, however, has changed in recent years for several reasons. The most important of these is the fact that pupils enrolled in the junior high school are too immature to enter upon specific vocational training. Another important reason is the impossibility of providing adequate specific vocational training for the large number of diverse interests to be found in the junior high school. As Koos ²¹ says:

"The conviction grows that the junior high school is not typically a place for this kind of training. This conviction is upheld by the fact of improved promotional rates helping to keep down the amount of overageness, and the improved retention of pupils which is holding pupils into senior high school grades where opportunities for specialization are more and more being provided. It is nevertheless vital to ward off the opposite belief now sometimes held that junior high schools should always refrain from giving training for specialization. The best interests of the given group of pupils must always be the chief criterion, and in some localities, as has already been emphasized, these may call for specialized training for those who are over-age or who for other reasons must leave school before or near the end of the junior high school period."

(6) Provisions for Adolescence.

It is well known that the years from 12 to 16 are years of rapid development for the majority of children. As will be shown in the next chapter, there are marked

21. Koos, Leonard V. Op. Cit. P. 61

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(8) Provisions for Adolescence.

It is well known that the years from 12 to 18 are years of rapid development for the majority of children. As will be shown in the next chapter, there are marked

changes in height, weight, and intellectual capacity. For most children this is the time of the arrival of pubescence. ²³ Other characteristics of this period, according to Davis, are an intense emotional development, the development of the instincts of gregariousness, venturesomeness, exploration, migration, organization, cooperation, and domination.

The fundamental problem of adolescence to the educator is to determine what methods of organization and administration of schools will produce valuable results in providing for the adolescent characteristics.

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Koos states:

"that the school reforms of this period must include a physical education that takes cognizance of the differences in physique between boys and girls and the rapidly increasing strength of the former. They may not ignore opportuneness at this time of sex education. They must recognize the fact that the pupil now rapidly approaching maturity will become increasingly impatient unless given a meatier mental diet than is provided in the conventional school -- that his enlarging social consciousness will be better satisfied by the materials of a functional education, rich in social, civic, and vocational interests than by the repetition of the preliminaries of an education. Nor can they neglect to provide opportunities for participation in a well-planned and efficiently directed social organization of the school that will allow for expression of the pupils social impulses. They must not ignore adolescence as a period of moral guidance and inspiration. As most of these reforms are next to impossible in the traditional

22. Koos, Leonard V. Op. Cit. Chapter III

23. Davis, Calvin O. Op. Cit. p. 84

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organization, we must look to the junior high school to bring them and then to perform the function of recognizing the nature of the adolescent child."

(6) Departmental Teaching.

This function is generally advocated on the grounds that it provides the conditions for better teaching. The chief arguments in favor of departmentalization are that it attracts specially trained teachers to work in these grades, and secondly that it is impossible for one teacher to handle the entire situation and subject-matter in one grade as in the elementary school. Furthermore departmentalization allows promotion by subject so that a teacher is not handicapped by pupils who are misplaced in some subjects, while the pupil in turn is not compelled to repeat subjects which he has already passed. In addition, departmentalization provides for training in special subjects such as art and music without disrupting the program.

Departmentalization, however, should not be begun immediately and completely. It should be gradually introduced. Briggs states that:

"the cure for a bad condition seems to be the gradual introduction of the desired or necessary departmentalization, a beginning being made in the "special subjects" perhaps as early as the third grade, with an extension to the academic subjects in the seventh year: Full departmentalization is not likely to be necessary before the ninth grade."

(7) Improving the Disciplinary Situation and Socializing Opportunities.

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(7) Improving the Psychological Situation and Socialization

It is a matter of common knowledge that discipline

is difficult to secure under the one-teacher regimen of the upper grade of the elementary school. The testimony of the majority is that, although the problems of discipline are not entirely eliminated they are greatly reduced by the junior high school due to frequent change of class-room and teacher, and to the adoption of subjects and curricula embracing activities more interesting and challenging to the pupil.

The socializing opportunities are increased through bringing the pupil into touch with a number of teachers, each of whom will bring to him something which a single personality cannot offer. With the union of the upper grades of the grammar school and the ninth grade of the high school we have a group that is more nearly homogeneous in age and interests so that a greater use can be made of the social, recreational, and athletic organization of the school than would be the case for either of these groups in the traditional system.

The foregoing are the more important functions of the junior high school and the means generally advocated for carrying them out. There are other functions such as effecting financial economy, relieving the building situation, satisfaction of community needs and others, but they are of secondary importance from an educational standpoint.

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It may readily be seen that the functions here dis-

cussed are closely interrelated. The functions of exploration and guidance and recognition of individual differences are complementary inasmuch as it is impossible to recognize individual differences until they have first been discovered.

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Moreover, as stated by Koos:

"Other instances of such interrelation are the tendency to retain pupils following the recognition of individual differences, the economy of time resulting from the improvement of teaching, or the bettered disciplinary situation accompanying the recognition of the nature of the child and the recognition of individual differences."

Recognition of individual differences is thus seen to have an important bearing upon the remaining functions of the junior high school. It is clear that better conditions for teaching are not being provided if no provision is made for individual differences in learning rate or capacity. Nor will economy of time result if all pupils are offered the same subjects and courses regardless of their individual interests, aptitudes, and capacities. Nor are we recognizing the nature of the child at adolescence if we do not take into consideration individual differences in age, and individual differences in physical, social, and physiological maturity with their accompanying rapid development of social and mental traits resulting in increased social, economic, and vocational interests, that are characteristic of this period.

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Indeed, if we accept Glass' description of the

²⁵Koos, Leonard V. Op. cit. p.113

²⁶Glass, James M. Op. cit. pp.20-21

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junior high school as the finding, sorting, and testing period of the public school system, we must consider the problem of individual differences as fundamentally related to all features and activities of the junior high school.

The need of the junior high school, therefore, for discovering the individual differences of its school population is clear. It must have adequate information of the nature and extent of these individual differences before suitable efforts to provide the proper means for their recognition can be made. An examination of the range, nature, and tendencies of individual variation among modern junior high school pupils should serve a useful purpose in furnishing a clearer picture to those interested in this organization of the individual differences characteristic of its pupils. Especially is this true in view of the fact that the school population is becoming more heterogeneous due to increased enrollments. Such a picture will be of assistance in demonstrating the necessity of providing for these individual differences, and in determining the means necessary for such provisions.

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CHAPTER III

THE INDIVIDUAL DIFFERENCES OF JUNIOR HIGH SCHOOL PUPILS

It is obvious even to the casual observer that school children, especially at the adolescent period, vary in many ways. Variation in height, weight, and physical development are perhaps most readily apparent. Pupils, however, differ from one another in many other respects, some of which such as differences in intellectual capacity, or musical or artistic ability are not so easily perceived.

¹
According to Briggs:

"An analysis of individual differences at early adolescence shows that they are of many kinds--some due to nature and some due to nurture. Briefly stated they are of race, sex, age, physical development, health, intellectual inheritance and training, tastes and aptitudes, environment, family traditions, social and economic status, aspirations, probable future schooling and command of the English language."

To what extent do pupils in the junior high school vary in each of these characteristics, and is there any evidence that variation is becoming greater as the school population grows? In the remainder of this chapter the writer shall attempt to furnish answers to these questions.

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To what extent do pupils in the junior high school vary in each of these characteristics, and in these instances that variation is becoming greater as the school cooperation grows? In the remainder of this chapter the writer shall attempt to furnish answers to these questions.

(a) Age

Probably the most important of the differences existing among pupils of the junior high school from an educational standpoint is that of age. An examination of the enrollment records of a typical junior high school shows wide variation in the ages of the pupils. Even in a single grade a difference of from 3 to 5 years or more will be found to exist between the youngest and oldest groups of pupils.

In order to secure more information on the extent of the individual differences in these grades, the writer made an examination of the ages and intelligence quotients of 1067 pupils in grades VII, VIII, and IX of the Belmont Junior High School, Belmont, Massachusetts. The distributions of the pupils according to these two items was obtained from the records of the pupils through the courtesy of the officials of the school.

Table I shows the distribution of these pupils according to age. An examination of the table discloses that ages in grade VII range from 10 years to fifteen years with a difference of five years between the youngest and oldest groups of pupils. The median age for this grade is 12.5 years. In grade VIII, the range extends from 11 years to 16 years, again disclosing a difference of 5 years between the two extremes. The median for the grade was

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found to be 13.7 years. In grade IX, the range extends from 12 years to 18 years with the median age 14.6 years.

TABLE I DISTRIBUTION ACCORDING TO AGE OF 1067 PUPILS OF THE BELMONT (MASS.) JUNIOR HIGH SCHOOL

AGES	10	11	12	13	14	15	16	17	18
Grade VII	5	48	198	95	39	10			
" VIII		3	84	187	67	20	6		
" IX			4	72	150	48	22	8	1
Total	5	51	286	354	256	78	28	8	1

In 1929 Clem and Malloy completed a study of the individual differences of 776 pupils of the Roosevelt Junior High School, Syracuse, New York. Table II indicates

TABLE II SHOWING THE AGES OF PUPILS OF THE ROOSEVELT JUNIOR HIGH SCHOOL (SYRACUSE, N.Y.) ACCORDING TO GRADES²

AGES	10	11	12	13	14	15	16	17	18
Grade VII-1	1	22	90	32	10	2			
" VII-2		4	49	39	33	11	1	1	1
" VIII-1		1	23	69	37	15	14	2	
" VIII-2		1	6	53	37	26	9	4	
" IX-1		2	20	52	26	8	3		
" IX-2			5	32	20	3	2		
Total	1	30	193	277	163	65	19	7	1

²Clem, Orlie M. and Malloy, D. V. Some Individual Differences of Pupils in One Typical Junior High School. Educational Administration and Supervision 16:39-52 Jan. 1930. p.40

found to be 13.7 years. In grade IX, the range extends from 12 years to 18 years with the median age 14.6 years.

TABLE I
DISTRIBUTION ACCORDING TO AGE OF 1087 PUPILS
OF THE BELMONT (MASS.) JUNIOR HIGH SCHOOL

AGES	10	11	12	13	14	15	16	17	18
Grade VII	2	48	198	95	32	10			
" VIII	3	84	187	67	20	5			
" IX	4	72	150	46	22	8	1		
Total	9	31	386	352	258	78	35	8	1

In 1933 Olem and Malloy completed a study of the individual differences of 778 pupils of the Roosevelt Junior High School, Syracuse, New York. Table II indicates

TABLE II
SHOWING THE AGES OF PUPILS OF THE ROOSEVELT
JUNIOR HIGH SCHOOL (SYRACUSE, N.Y.)
ACCORDING TO GRADES

AGES	10	11	12	13	14	15	16	17	18
Grade VII-1	1	28	90	32	10	2			
" VII-2	4	49	39	33	11	1			
" VIII-1	1	33	59	37	15	14	1		
" VIII-2	1	6	23	37	28	9	4		
" IX-1	2	80	52	28	8	3			
" IX-2	3	32	32	20	3	2			
Total	1	30	193	277	183	62	19	7	1

Olem, Orlie M. and Malloy, D. V.
Differences of Pupils in One Typical Junior High School.
Educational Administration and Supervision 18:38-52
Jan. 1930. p. 40

the age of these pupils according to grades. It shows that the mean age in grade VII is 12 years; in grade VIII, 13 years; and in grade IX, 14 years. It also shows that the youngest pupil is 10 years old and the oldest, a pupil in grade VII-2, 18 years, revealing a difference of 8 years in age and of one term in school work.

3

Powers made a study of the pupils enrolled in grades VII, VIII, and IX of the Minneapolis Junior High Schools in 1923-4. In table III, the distribution by ages of the pupils is shown.

TABLE III NUMERICAL AND PERCENTAGE DISTRIBUTION BY AGES
OF 14,594 PUPILS ENROLLED IN GRADES VII,
VIII, AND IX OF THE MINNEAPOLIS
SCHOOLS, 1923-4.⁴

AGE	NUMBER	PER CENT	AGE	NUMBER	PER CENT
9½	1	0	14	2154	14.8
10	4	0.0	14½	1962	13.4
10½	33	0.2	15	1574	10.3
11	143	1.0	15½	838	5.7
12	938	6.4	16	535	3.7
12½	1617	11.1	16½	201	1.7
13	1757	12.0	17	90	0.6
13½	2151	14.7	17½	29	0.2
			18	33	0.2

In Table IV the distribution of the ages of the Belmont and Roosevelt Junior High Schools by number and per cent are shown.

A comparison of the figures shown in Table IV reveals that the proportions of each age represented in the

³Powers, J.Orin Instructional Outcomes in Junior High Schools. University of Minnesota Press. 1927

⁴Koos, Leonard V. Op. cit. p.82

the age of these pupils according to grades. It shows that the mean age in grade VII is 13 years; in grade VIII, 13 years; and in grade IX, 14 years. It also shows that the youngest pupil is 10 years old and the oldest, a pupil in grade VII-2, 18 years, revealing a difference of 8 years in age and of one term in school work.

Powers made a study of the pupils enrolled in grades VII, VIII, and IX of the Minneapolis Junior High Schools in 1923-4. In table III, the distribution by ages of the pupils is shown.

TABLE III
NUMERICAL AND PERCENTAGE DISTRIBUTION BY AGES
OF 14,894 PUPILS ENROLLED IN GRADES VII,
VIII, AND IX OF THE MINNEAPOLIS
SCHOOLS, 1923-4.³

AGE	NUMBER	PER CENT	AGE	NUMBER	PER CENT
9+	1	0	14	2184	14.8
10	4	0.0	14+	1982	13.4
10+	33	0.2	15	1274	10.3
11	142	1.0	15+	838	5.7
12	338	2.4	16	838	5.7
12+	1819	11.1	16+	301	1.7
13	1787	12.0	17	90	0.6
13+	2181	14.7	17+	29	0.2
			18	33	0.2

In Table IV the distribution of the ages of the Belmont and Roosevelt Junior High Schools by number and per cent are shown.

A comparison of the figures shown in Table IV reveals that the proportions of each age represented in the

³Powers, J. Orin. Instructional Outcomes in Junior High Schools. University of Minnesota Press. 1927.
Koss, Leonard V. Op. cit. p. 82.

two junior high schools are similar. They also reveal no marked departure from the trend shown in the figures secured by Powers, though there is a slight decrease in the percentage of over-age pupils,--pupils 16 years or over--in the latter two groups. This may be an indication of the tendency of "improved promotional rates help-

TABLE IV NUMERICAL AND PERCENTAGE DISTRIBUTION BY AGES
OF 1067 PUPILS OF THE BELMONT (MASS.) JUN-
IOR HIGH SCHOOL, AND OF 776 PUPILS OF
THE ROOSEVELT (SYRACUSE, N.Y.)
JUNIOR HIGH SCHOOL

Belmont Junior High School			Roosevelt Junior High School		
Age	Number	Per Cent	Age	Number	Per Cent
10	5	0.004	10	1	0.0
11	51	0.049	11	28	0.36
12	286	0.246	12	170	0.230
13	354	0.322	13	218	0.283
14	256	0.240	14	201	0.269
15	78	0.073	15	100	0.128
16	28	0.025	16	25	0.032
17	8	0.0075	17	12	0.015
18	1	0.0	18	1	0.0

ing to keep down the amount of over-ageness, and the improved retention which is holding pupils into the senior-high grades" which Koos⁵ claimed to be increasingly apparent, although the decrease is not substantial enough to warrant a definite conclusion.

⁵Koos, Leonard V. Op. cit. p.61

two junior high schools are similar. They also reveal no marked departure from the trend shown in the figures secured by Powers, though there is a slight decrease in the percentage of over-age pupils,--pupils 18 years or over--in the latter two groups. This may be an indication of the tendency of "improved promotional rates help-

TABLE IV
NUMERICAL AND PERCENTAGE DISTRIBUTION BY AGES
OF 1097 PUPILS OF THE BELMONT (MASS.) JUN-
IOR HIGH SCHOOL, AND OF 778 PUPILS OF
THE ROOSEVELT (SYRACUSE, N.Y.)
JUNIOR HIGH SCHOOL

Belmont Junior High School				Roosevelt Junior High School			
Age	Number	Per Cent	Age	Number	Per Cent	Age	Per Cent
10	5	0.004	10	1	0.0	10	0.0
11	51	0.043	11	28	0.036	11	0.036
12	286	0.248	12	170	0.230	12	0.230
13	354	0.312	13	318	0.383	13	0.383
14	356	0.310	14	301	0.383	14	0.383
15	78	0.073	15	100	0.128	15	0.128
16	28	0.025	16	25	0.032	16	0.032
17	8	0.0075	17	13	0.015	17	0.015
18	1	0.0	18	1	0.0	18	0.0

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²Kose, Leonard V. Op. cit. p. 61

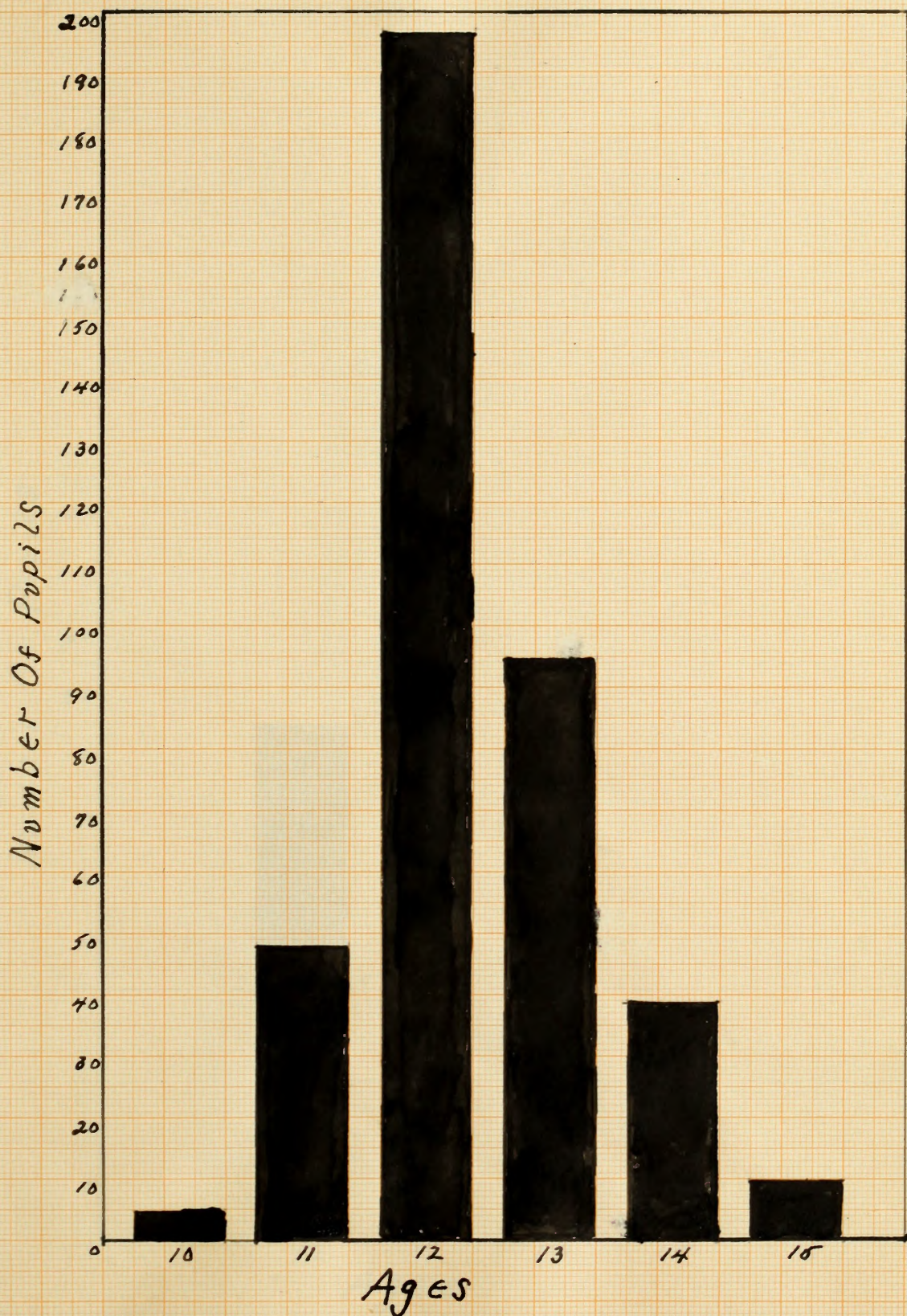


Figure 1. Distribution By Ages Of 395 Pupils In Grade VII Of The Belmont (Mass.) Junior High School

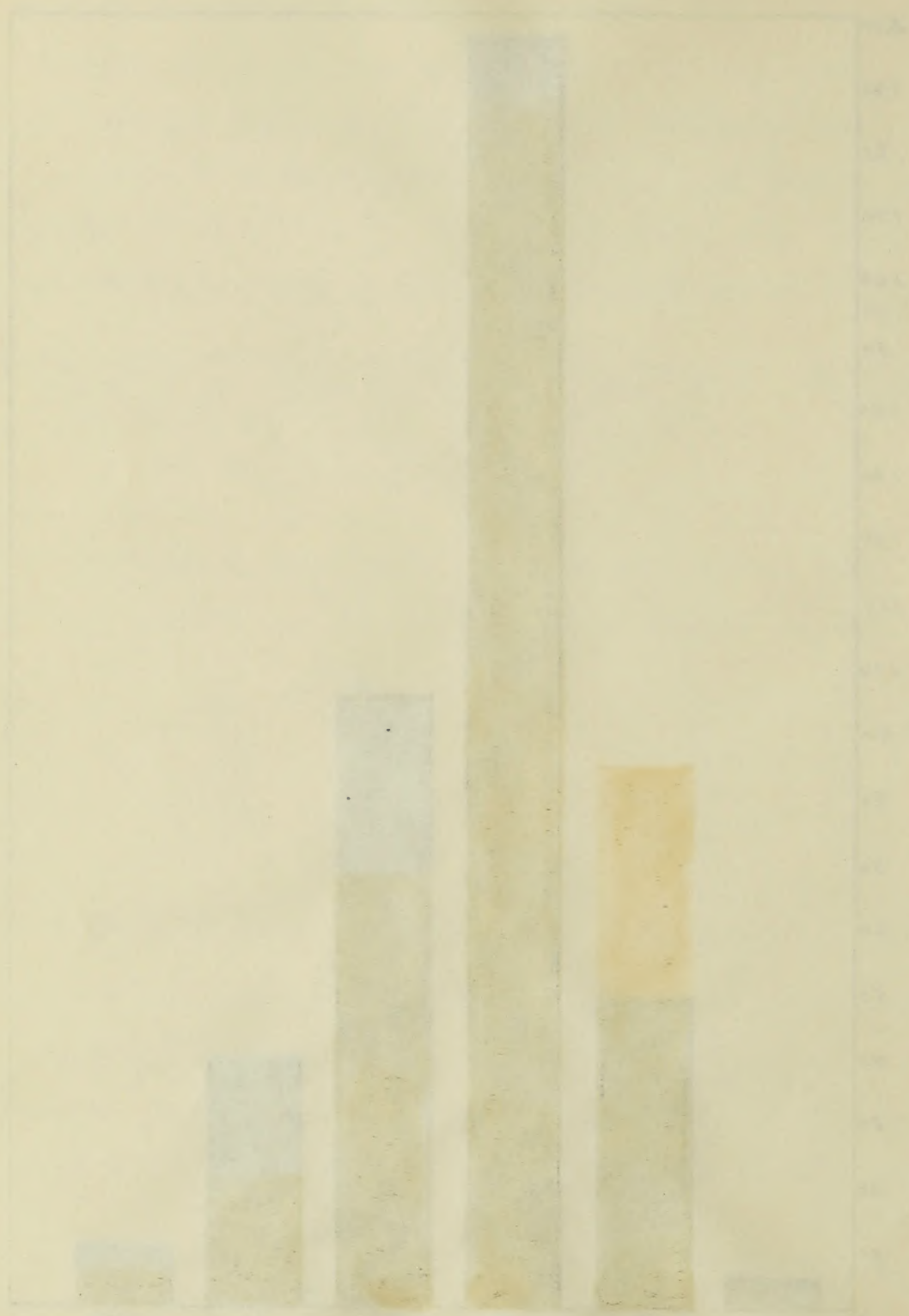


Figure 1. Comparison of the results of the two methods. The values are the mean of the three replicates.

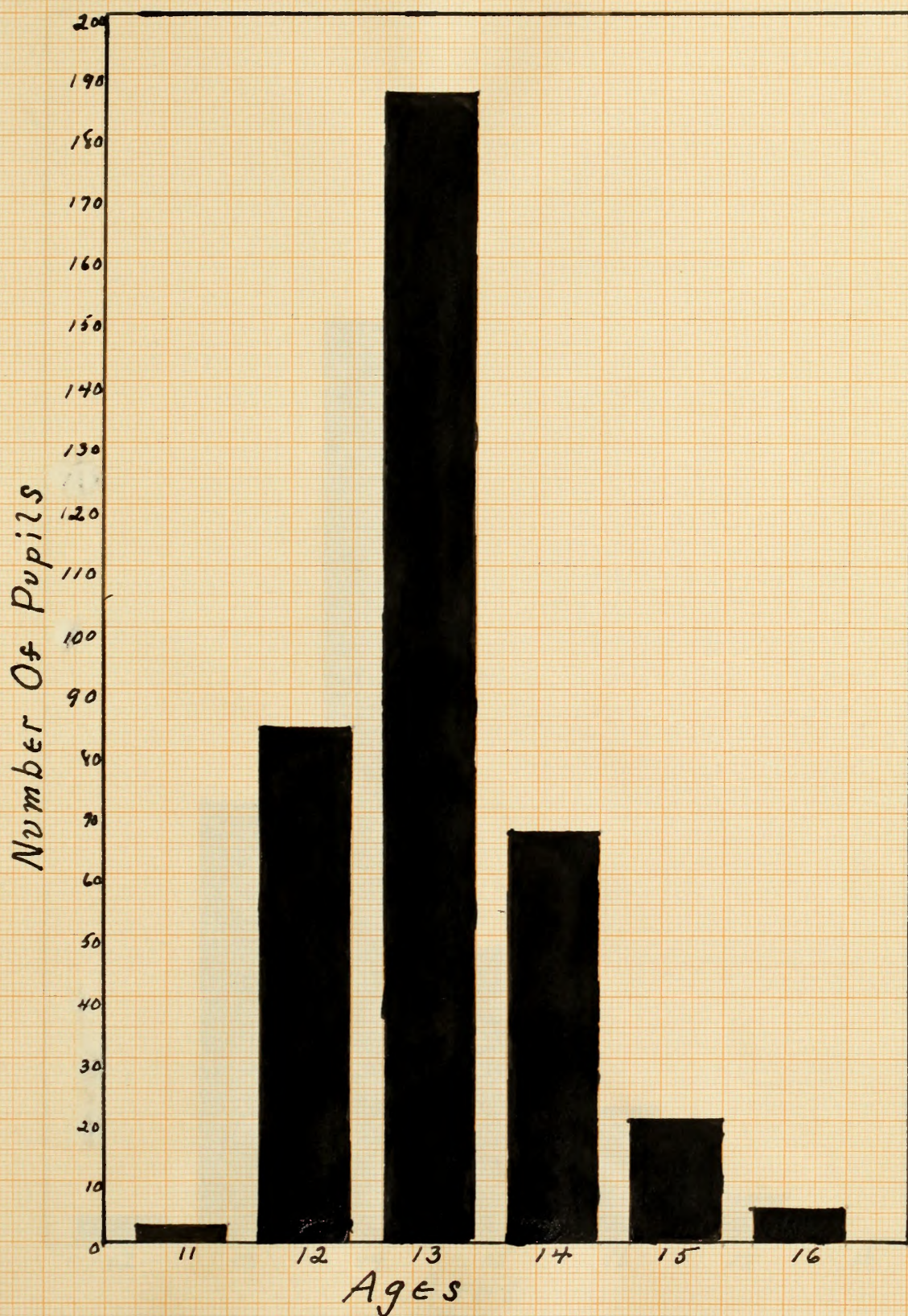


Figure 2. Distribution By Ages Of 367 Pupils In Grade VIII Of The Belmont (Mass.) Junior High School

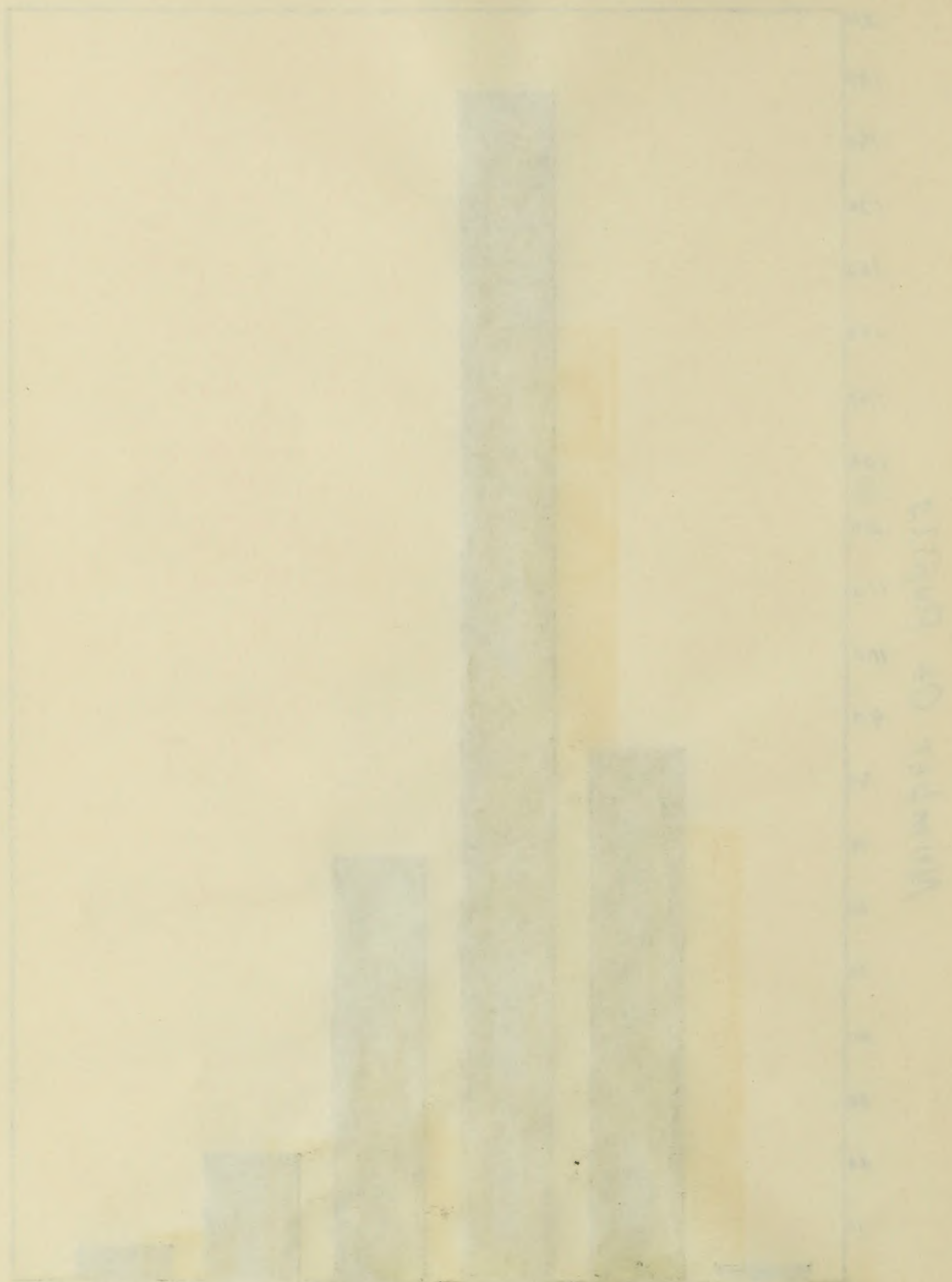


Figure 1: Distribution of Age Groups

Source: U.S. Census Bureau (2000)

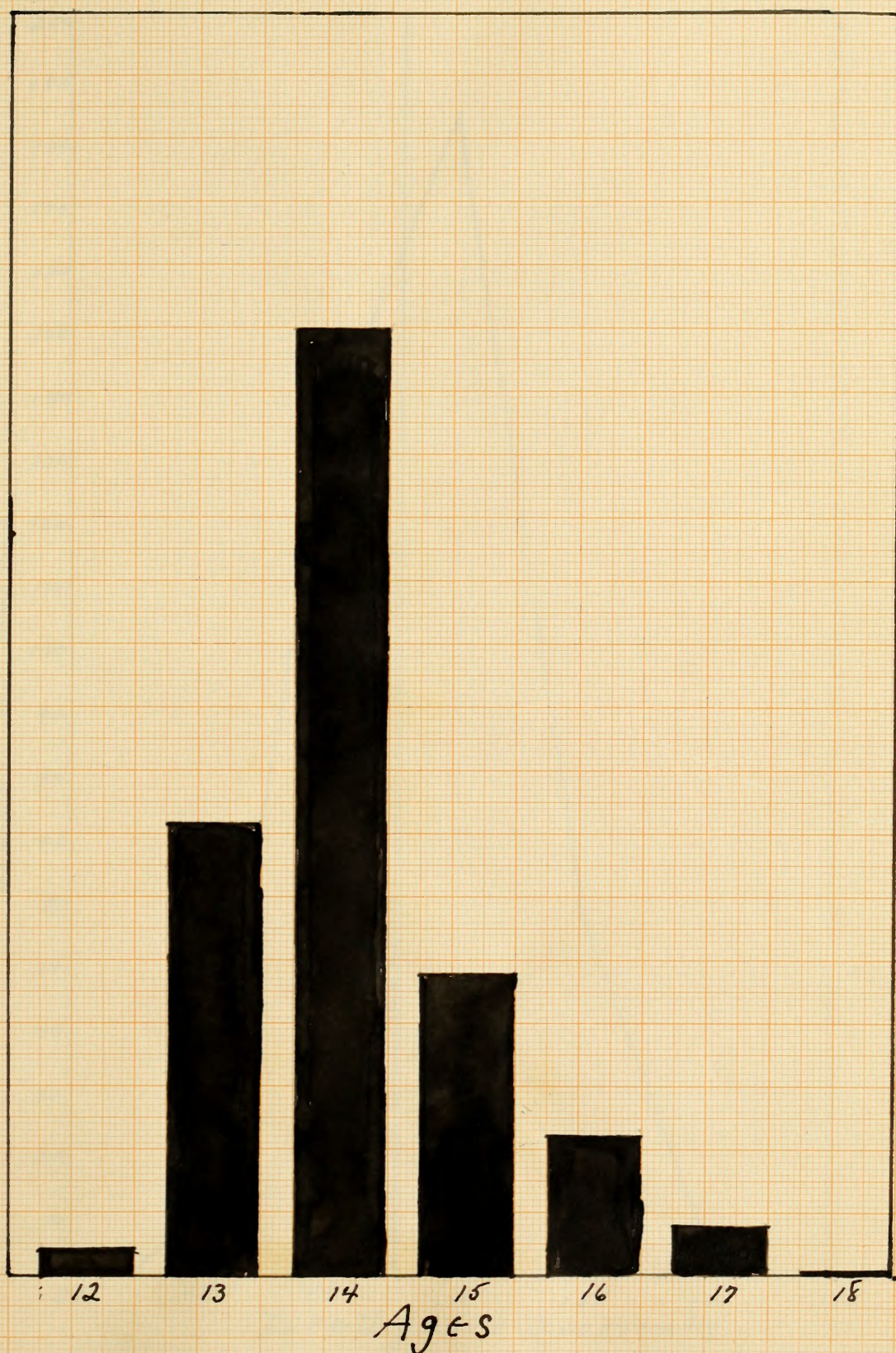


Figure 3. Distribution By Ages Of 305 Pupils In Grade IX Of The Belmont (Mass.) Junior High School.

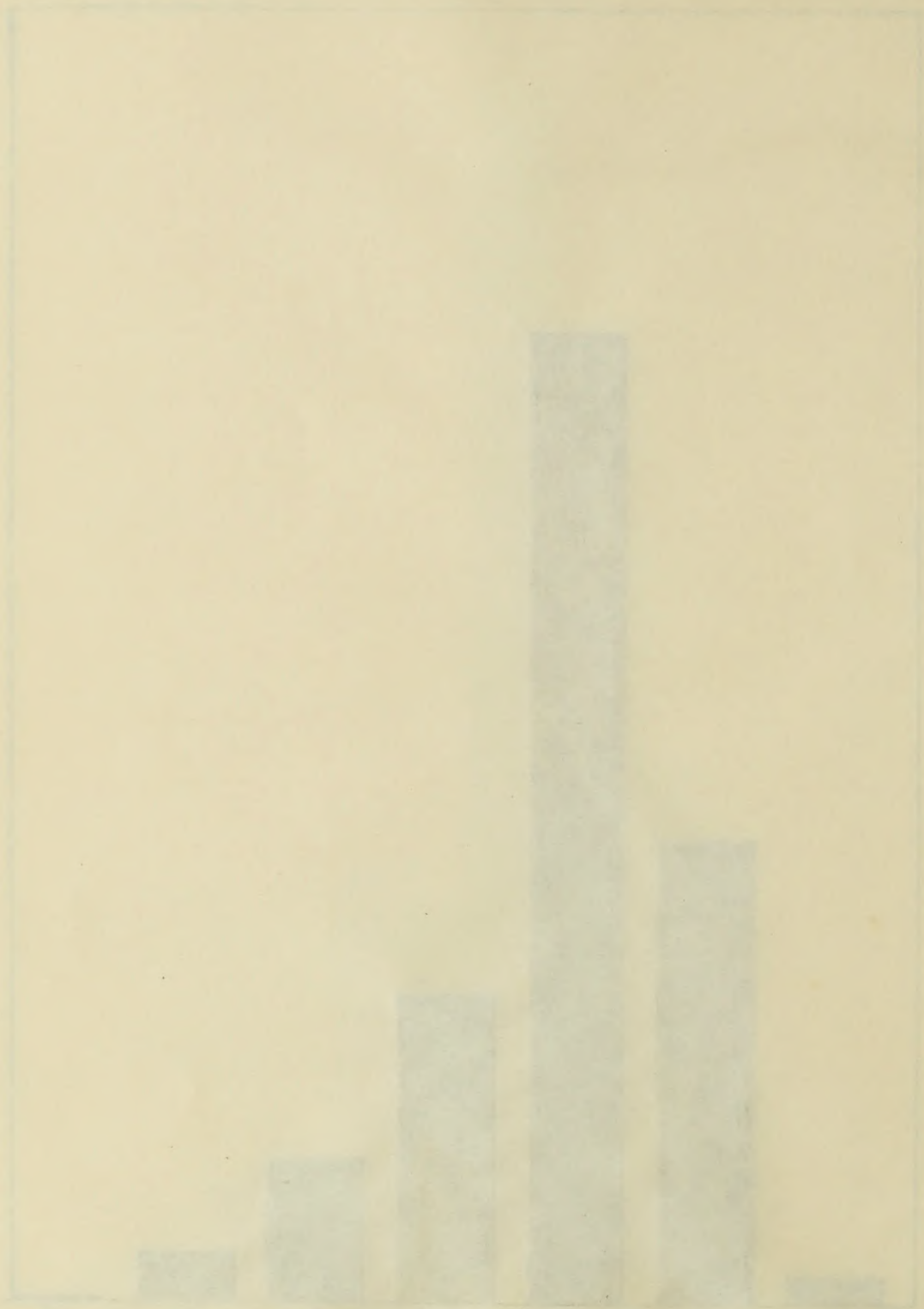


Figure 3. Distribution of the number of students in each grade in the school.

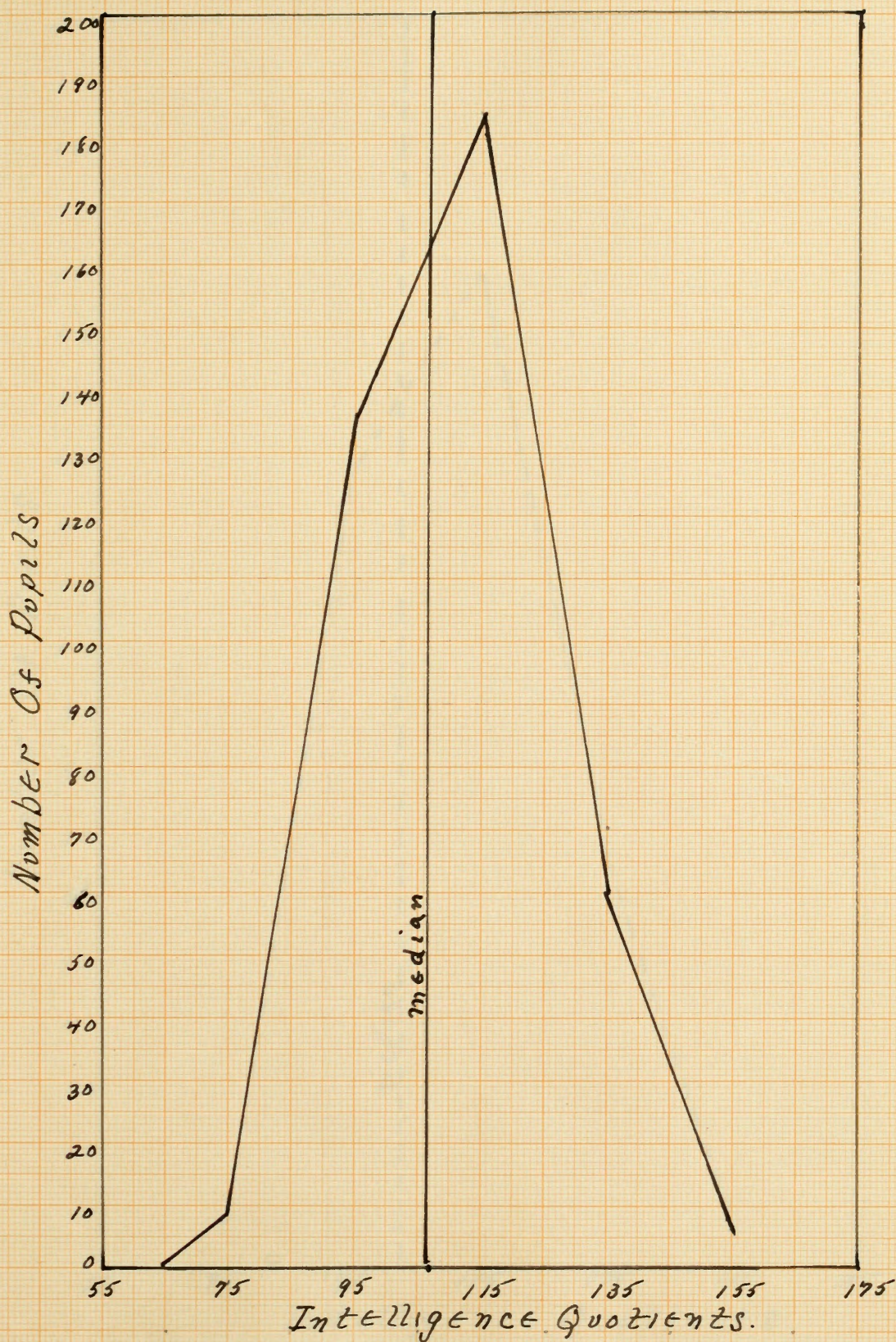


Figure 4. Distribution Of 395 Pupils, According To I.Q.s,
In Grade VII Of The Belmont (Mass) Junior High School

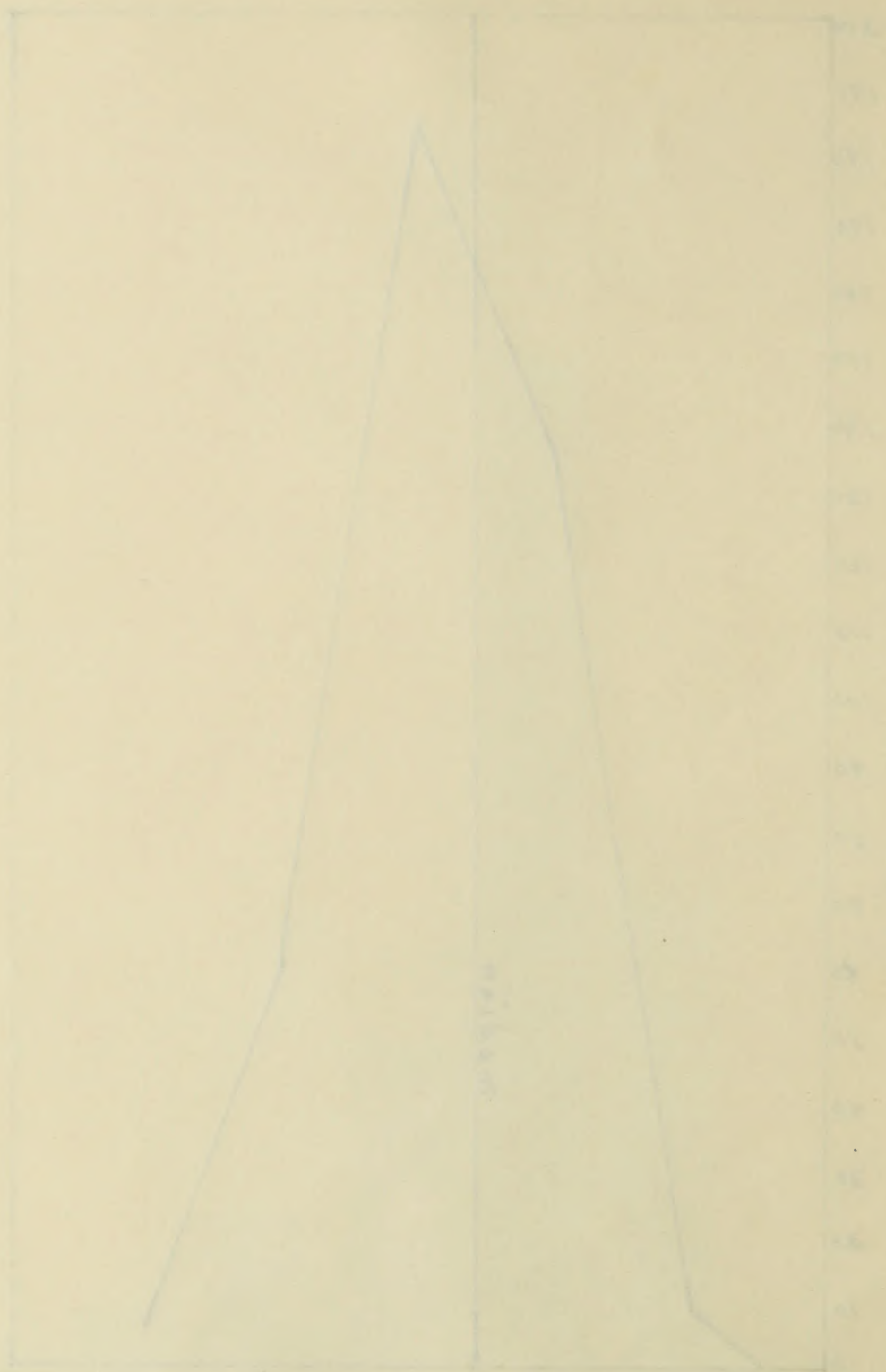


Figure 1. A line graph showing the temperature of a substance over time. The temperature starts at 0°C at 0 minutes, rises to a peak of 85°C at 4 minutes, then falls to 10°C at 8 minutes, and finally rises slightly to 15°C at 10 minutes.

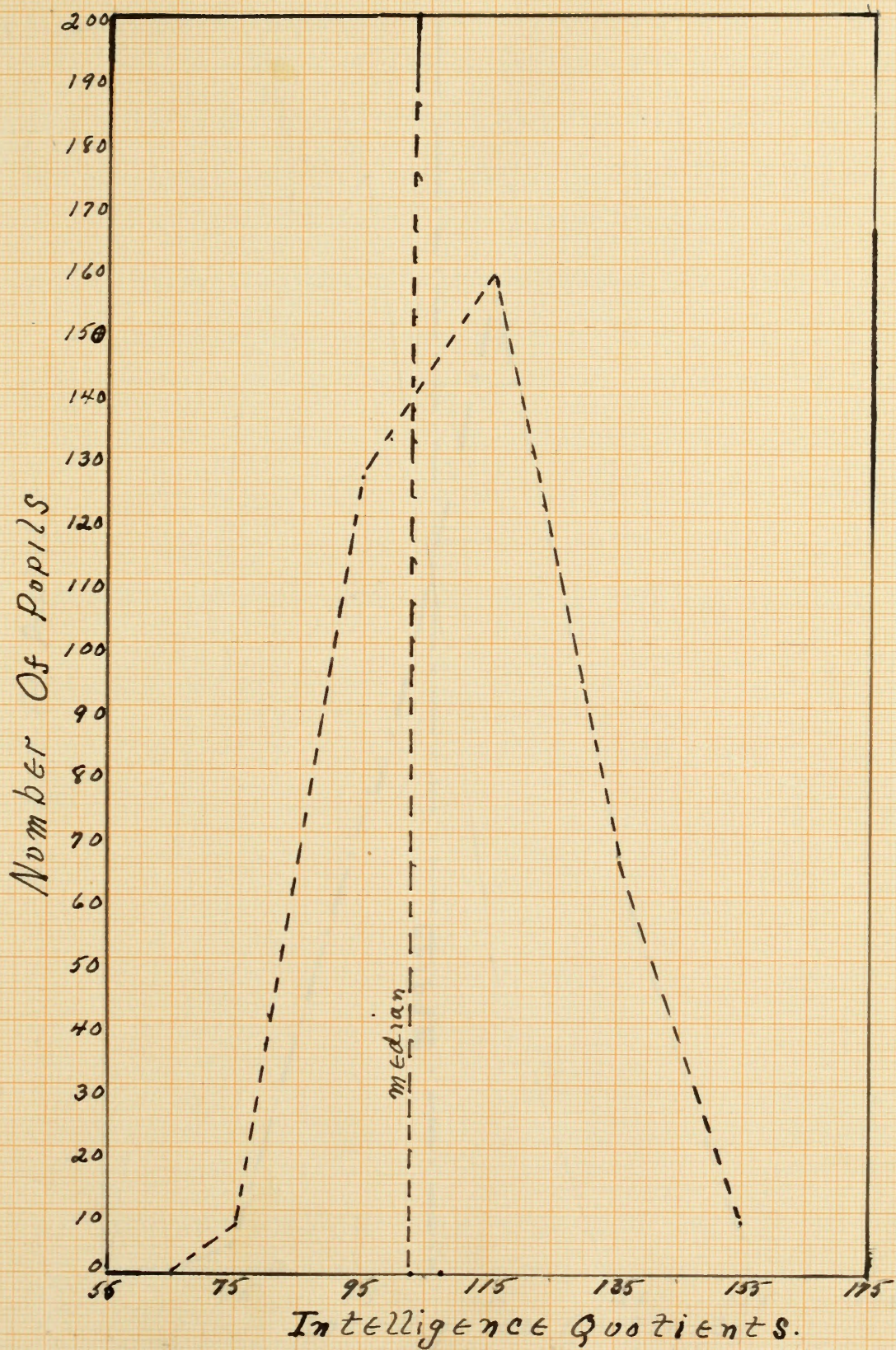


Figure 5. Distribution, According To I.Q.s. Of 367 Pupils In Grade VIII Of The Belmont (Mass.) Junior High School.

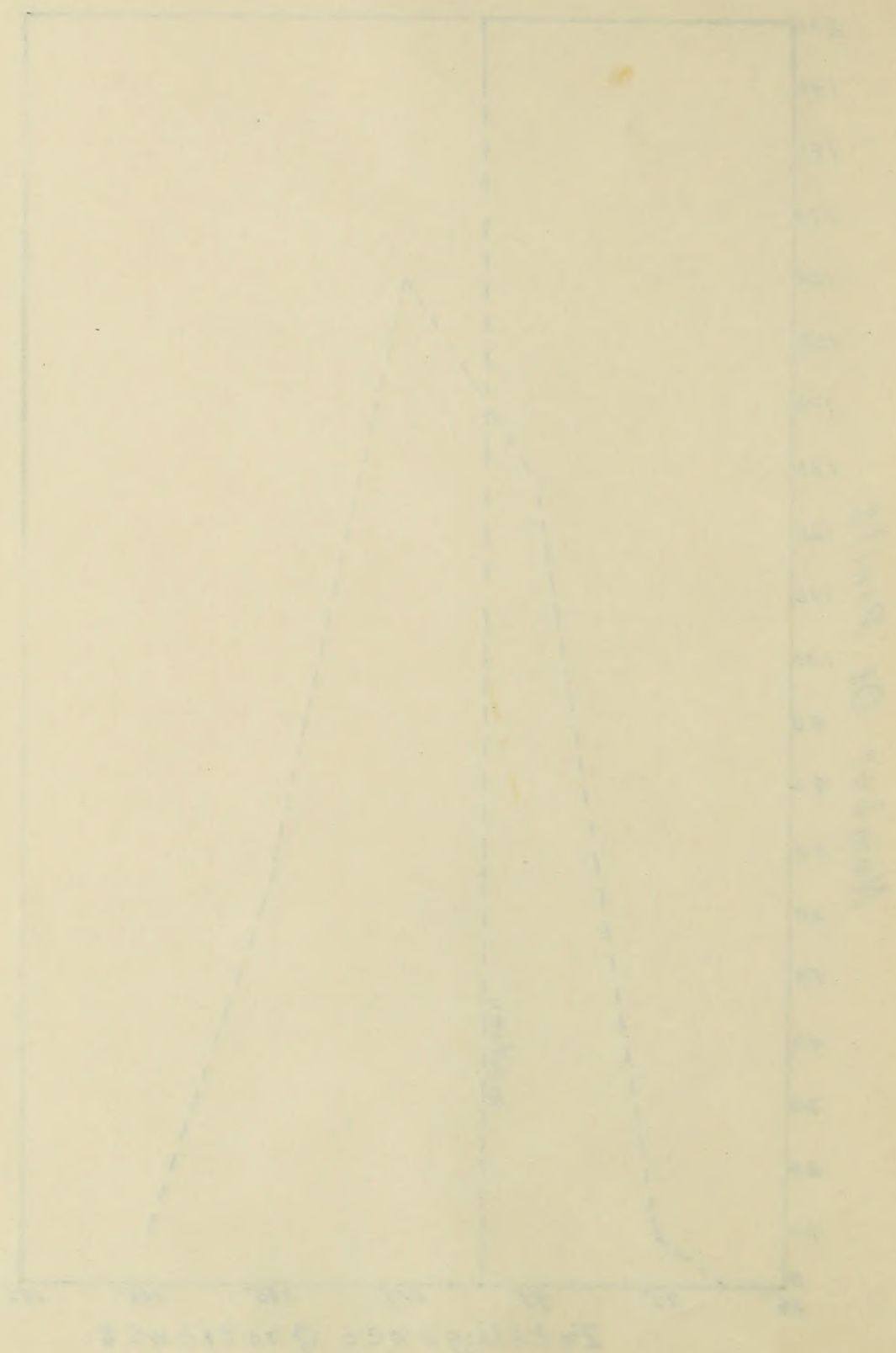


Figure 1. Distribution of weights in 1000 fish. The curve is the theoretical normal distribution. The vertical line is the mean weight.

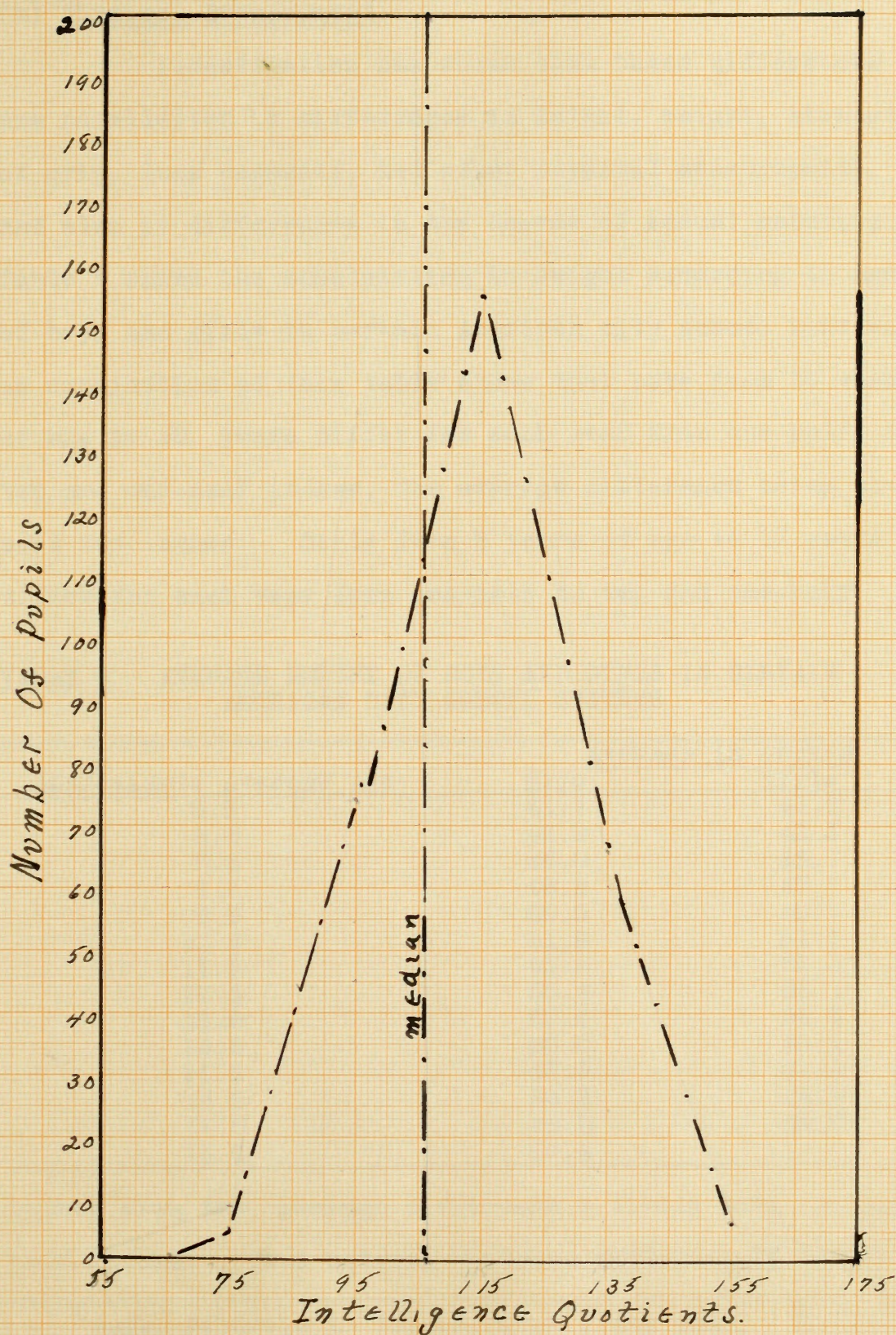


Figure 6. Distribution, According To I. Q.s, Of 305 Pupils
In Grade IX Of The Belmont (Mass.) Junior High School

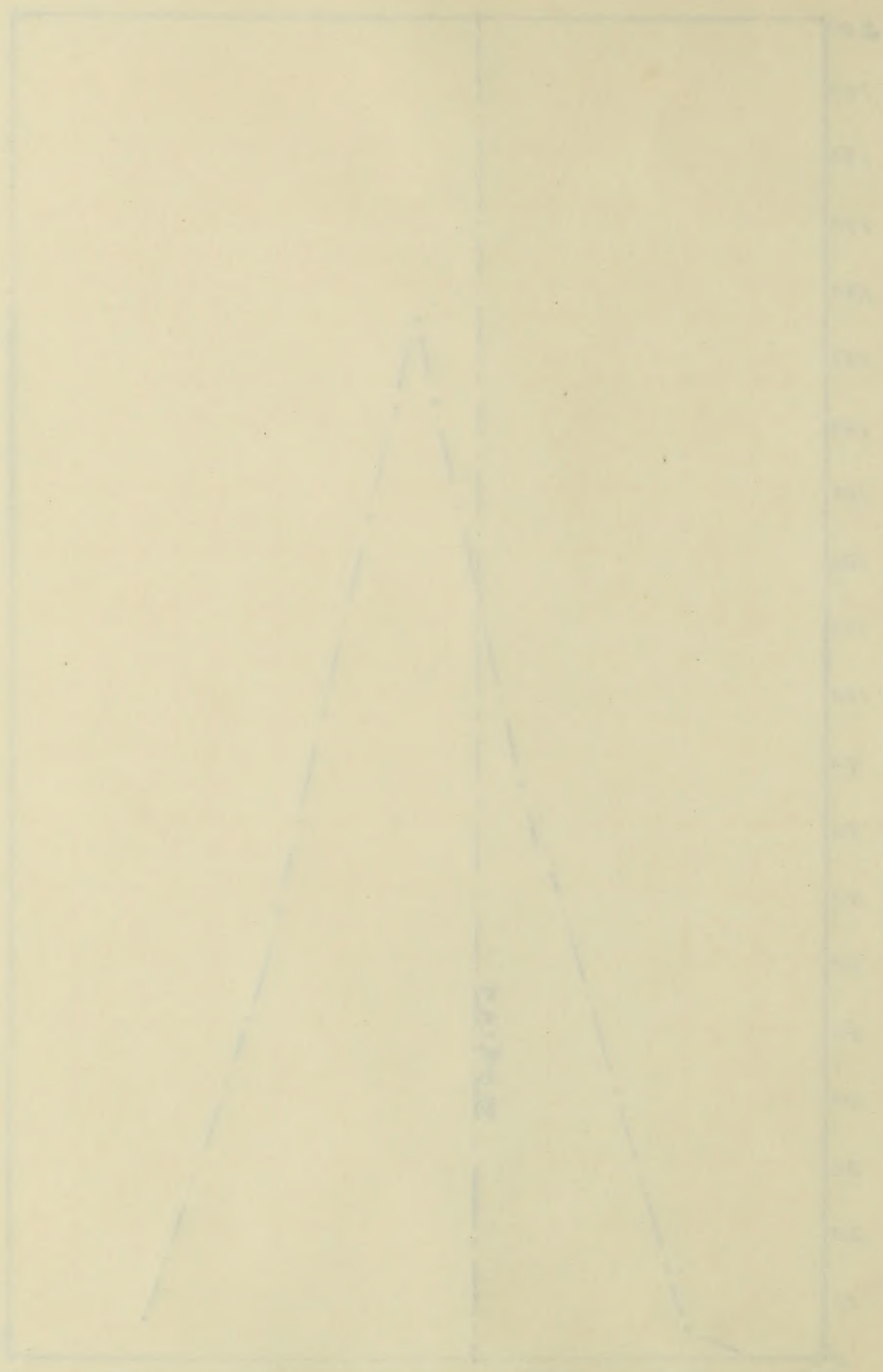


Figure 1. A triangular distribution of work value over time. The peak value is 10 units of work, occurring at a time of 10 units.

(b) Physical Development

Investigation has shown that these differences are paralleled by differences in height, weight, strength of grip, lung capacity, and other physical measurements, and also by differences in the degree of sexual maturity. Table V shows the acceleration in height according to age of boys and girls in certain American city school systems. An examination of this table shows that boys from 10 years of age to 18 years differ for each year from one-half to two and one-half inches, the average difference being almost two inches. Girls from 9 years of age to 17 years differ for each year from one-half to two and one-half

TABLE V AVERAGE HEIGHT OF BOYS AND GIRLS IN CERTAIN AMERICAN CITY SCHOOL SYSTEMS

Approximate Average Age	Average in inches	
	Boys	Girls
5.5	41.7	41.3
6.5	43.9	43.3
7.5	46.0	45.7
8.5	48.8	47.7
9.5	50.0	49.7
10.5	51.9	51.7
11.5	53.6	53.8
12.5	55.4	56.1
13.5	57.5	58.5
14.5	60.0	60.4
15.5	62.9	61.6
16.5	64.9	62.2
17.5	66.5	62.7
18.5	67.4	

inches with the average difference a little over one and one-half inches. Thus between children differing by two or three

⁶Burk, Frederic L. (citing from Franz Boas) "Growth of Children in Height and Weight" American Journal of Psychology (April 1898) Vol. IX. P. 262

(b) Physical Development

Investigation has shown that these differences are manifested by differences in height, weight, strength of grip, lung capacity, and other physical measurements, and also by differences in the degree of sexual maturity. Table V shows the acceleration in height according to age of boys and girls in certain American city school systems. An examination of this table shows that boys from 10 years of age to 18 years differ on each year from one-half to two and one-half inches, the average difference being about two inches. Girls from 8 years of age to 17 years differ on each year from one-half to two and one-half

TABLE V
AVERAGE HEIGHT OF BOYS AND GIRLS IN CERTAIN
AMERICAN CITY SCHOOL SYSTEMS

Average in inches		Approximate Average Age
Boys	Girls	
41.7	41.8	8.5
43.3	43.3	9.5
45.0	45.7	10.5
46.8	47.7	11.5
48.0	49.7	12.5
49.8	51.7	13.5
51.8	53.8	14.5
53.8	55.4	15.5
55.4	57.5	16.5
57.5	59.0	17.5
59.0	61.6	18.5
61.6	64.3	19.5
64.3	66.7	20.5
66.7		21.5

inches with the average difference a little over one and one-half inches. Thus between children differing by two or three

Quinn, Frederick L. (Citation from Bureau of Census)
Children in Height and Weight. American Journal of Psychology
(April 1928) Vol. XX, P. 282

years, there may be differences of one to seven and one-half inches or more in the junior high school grades.

TABLE VI PERCENTAGES OF 3825 BOYS (1) PREPUBESCENT, (2) PUBESCENT, (3) POSTPUBESCENT, (4) PUBESCENT AND POSTPUBESCENT (COMBINED) BY HALF-YEARS FROM TWELVE AND ONE-FOURTH TO SEVENTEEN AND THREE-FOURTHS YEARS OF AGE⁷

Age	Pre-pubescent	Pubescent	Post-Pubescent	Pubescent and Postpubescent
12.25	81	16	2	18
12.75	69	25	6	31
13.25	55	26	18	44
13.75	41	28	31	59
14.25	26	28	46	74
14.75	16	24	60	84
15.25	9	20	70	90
15.75	5	10	85	95
16.25	2	4	93	97
16.75	1	4	95	99
17.25		2	98	100
17.75			100	100

The investigations of Baldwin and Crampton show the relation between the stage of physical maturity the pupil has reached and his age. An examination of their findings as shown in tables VI and VII reveals that a small percentage of boys at 12 years of age have already arrived at puberty while others at seventeen years have not reached this stage of development. For girls, this period begins somewhat earlier,

⁷Crampton, C. Y. "Physiological Age--A Fundamental Principle" American Physical Education Review (March, 1908) Vol. XIII, p. 150

years, there may be differences of one to seven and one-half inches or more in the junior high school grades.

TABLE VI
PERCENTAGES OF 2880 BOYS (1) PREPUBERTAL,
(2) PUBERTAL, (3) POSTPUBERTAL, (4) PUBERTAL AND POSTPUBERTAL (COMBINED) BY
HALF-YEARS FROM TWELVE AND ONE-FOURTH
TO SEVENTEEN AND THREE-FOURTHS YEARS
OF AGE

Age	Prepubertal	Pubertal	Postpubertal	Pubertal and Postpubertal
12.50	81	18		18
13.00	69	28	3	81
13.50	53	38	9	84
14.00	41	48	11	89
14.50	28	58	14	94
15.00	18	64	18	96
15.50	9	70	21	99
16.00	5	78	17	100
16.50	3	84	13	100
17.00	1	88	11	100
17.50		92	8	100
18.00		95	5	100
18.50		97	3	100
19.00		98	2	100
19.50		99	1	100
20.00		100	0	100

The investigation of Schmidt and Crumpton show the relation between the state of physical maturity and the age. An examination of their findings as shown in Tables VI and VII reveals that a small percentage of boys at 12 years of age have already arrived at puberty while others at seventeen years have not reached this stage of development. For girls, this period begins somewhat earlier.

some pupils at 10 years already having entered upon this period of physiological change, while others at 16 years have not begun to experience the physical change characteristic of approaching sexual maturity.

TABLE VII PERCENTAGES OF 1241 GIRLS (1) PREPUBESCENT, (2) PUBESCENT, (3) POSTPUBESCENT, AND (4) PUBESCENT AND POSTPUBESCENT (COMBINED) BY HALF-YEARS FROM TEN AND ONE-HALF TO SIXTEEN AND ONE-HALF YEARS OF AGE⁸

Age	Pre-pubescent	Pubescent	Post-pubescent	Pubescent and Postpubescent
10.5	93.75	6.25	0.00	6.25
11.0	100.00	0.00	0.00	0.00
11.5	78.84	19.23	1.92	21.15
12.0	62.06	37.93	0.00	37.93
12.5	58.20	23.88	17.91	41.79
13.0	39.53	34.88	25.58	60.46
13.5	15.15	37.87	49.96	84.83
14.0	15.38	38.46	46.15	84.61
14.5	4.83	17.74	77.42	95.61
15.0	0.00	14.54	85.45	99.99
15.5	1.55	7.81	90.62	98.43
16.0	2.04	6.12	91.83	97.95
16.5	0.00	3.17	96.83	100.00

It is easily seen, therefore, that pupils in the junior high school may be five or six years more advanced as regards physical maturity than others in the same grade.

Children in these grades differ also in the matter of health, freedom from physical defects, and other constitutional traits. Table VIII shows the general health status of

⁸ Baldwin, Bird T. "A Measuring Scale for Physical Growth and Physiological Age" Fifteenth Yearbook of the National Society for the Study of Education. 1916. Part 1, p. 17

some pupils at 10 years already having entered upon this period of physiological change, while others at 12 years have not begun to experience the physical change characteristic of approaching sexual activity.

TABLE VII
PERCENTAGES OF GIRLS (1) PREPUBESCENT,
(2) PUBESCENT, (3) POSTPUBESCENT, AND
(4) PUBESCENT AND POSTPUBESCENT (COM-
BINED) BY HALF-YEARS FROM TEN AND
ONE-HALF TO SIXTEEN AND ONE-HALF
YEARS OF AGE

Age	Pre- pubescent	Post- pubescent	Post- pubescent and pubescent
10.5	33.73	6.25	8.25
11.0	100.00	0.00	0.00
11.5	76.84	19.25	1.15
12.0	62.06	37.93	0.00
12.5	58.80	33.88	17.91
13.0	39.53	34.88	35.58
13.5	15.15	37.87	46.98
14.0	15.38	38.46	46.15
14.5	4.83	17.74	77.43
15.0	0.00	14.34	85.45
15.5	1.55	7.81	90.83
16.0	2.04	6.19	91.83
16.5	0.00	3.17	96.83

It is easily seen, therefore, that pupils in the junior high school may be five or six years more advanced as regards physical activity than others in the same grade.

Children in these grades differ also in the matter of health, freedom from physical defects, and other constitutional traits. Table VIII shows the general health status of

⁸ Bellamy, Mrs. T. A. "A Manual Scale for Physical Growth and Physiological Age." *Physiological Yearbook of the National Society for the Study of Education*. 1918. Part I, p. 17.

the pupils of the Roosevelt Junior High School as determined by Clem and Malloy. Of the 776 pupils, 587 or 75.6 per cent are in good health; 691 or 89 per cent have had the measles; 559 or 72 per cent have had the mumps; 381 or 49 per cent have had scarlet fever; 611 or 78.6 per cent have had chicken pox; 39 or 5 per cent have had typhoid; 152 or 19.5 per cent have had diptheria; 27 or 3.4 per cent have had infantile paralysis.

TABLE VIII SHOWING GENERAL HEALTH OF PUPILS; PRESENCE
OF PHYSICAL DEFECTS; AND DISEASES HAD BY
PUPILS OF THE ROOSEVELT JUNIOR HIGH
SCHOOL⁹

<u>General Health</u>	<u>Physical Defects</u>				<u>Diseases</u>	
	VII-1	VII-2	VIII-1	VIII-2	IX-1	IX-2
Good	115	116	128	123	62	43
Fair	34	20	17	26	32	14
Poor	8	3	6	7	17	5
Tonsils	13	18	17	11	6	3
Teeth	17	20	21	17	9	7
Glands	6	3	2	6	3	1
Sight	57	27	32	19	13	11
Hearing	16	8	5	7	3	2
Defective						
Speech	10	4	6	3	7	2
Lungs	7	6	5	7	3	2
Heart	4	3	6	9	7	3
Adenoids	12	17	11	23	12	9
Skin	3	4	5	7	3	1
Nervous						
Disorders	4	8	9	14	11	3
Kidneys	2	3	2	3	2	1
Goitre	6	11	9	17	16	9
Measles	127	135	123	143	107	56
Mumps	93	97	102	127	93	47

⁹ Clem, Orlie M. and Malloy, K. V. Op. cit. p.41

the pupils of the Roosevelt Junior High School as deter-
 mined by Glue and Kelly. Of the 775 pupils, 287 or
 37.2 per cent are in good health; 201 or 26 per cent have
 had the measles; 559 or 72 per cent have had the mumps;
 381 or 49 per cent have had scarlet fever; 611 or 78.8
 per cent have had chicken pox; 93 or 12 per cent have had
 typhoid; 122 or 15.8 per cent have had diphtheria; 27 or
 3.4 per cent have had infantile paralysis.

TABLE VIII
 SHOWING GENERAL HEALTH OF PUPILS; PRESENCE
 OF PHYSICAL DEFECTS; AND DISEASES HAD BY
 PUPILS OF THE ROOSEVELT JUNIOR HIGH
 SCHOOLS

General Health		Physical Defects		Measles	
	VII-1	VII-2	VII-3	VII-4	VII-5
Good	115	115	123	123	123
Fair	34	30	17	28	23
Poor	8	3	6	7	17
Tonsils	13	12	17	11	6
Teeth	17	20	17	17	3
Glands	3	3	3	3	1
Stomach	27	27	28	18	11
Hearing	18	8	3	7	3
Defective					
Speech	10	4	6	3	7
Lungs	7	8	6	7	3
Heart	4	3	3	7	3
Arteries	12	17	11	22	13
Blood	3	4	3	7	1
Nervous					
Disorders	4	3	3	14	11
Kidneys	3	3	3	3	1
Gall	3	11	3	17	16
Measles	127	122	123	123	107
Mumps	93	37	102	127	23

(c) Mental Differences

One of the most significant facts revealed by a study of individual differences is the wide variation in intellectual capacity existing among pupils in the junior high school. An examination of the records of pupils in these grades shows a remarkable range of differences in mental ability. In table IX is shown the distribution of pupils according to Intelligence Quotients derived from the Kuhlman-Anderson Intelligence Test as obtained by the writer from an examination of the pupils' records. In grade VII Intelligence quotients ranged from 69 to 152 with the median score 101. In grade VIII, the range extends from 68 to 146 with the median I. Q. 102. In grade IX, in a group of 305 pupils, the range extends from 71 to 149 with the median at 104.

TABLE IX DISTRIBUTION OF PUPILS ACCORDING TO INTELLIGENCE
QUOTIENTS IN THE BELMONT (MASS.) JUNIOR HIGH
SCHOOL

Grades	Intelligence quotients				
	55-75	75-95	95-115	115-135	135-155
Grade VII	9	136	184	60	6
" VIII	8	126	158	66	8
" IX	5	74	154	66	6
Total	<u>22</u>	<u>336</u>	<u>496</u>	<u>192</u>	<u>20</u>

Theisen reports the results of classification of pupils about to enter grades VII-B of the Cleveland Junior High Schools in January, 1920. Preparatory to classification, the pupils

(c) Mental Differences

One of the most significant facts revealed by a study of individual differences in the wide variation in intellectual capacity existing among pupils in the Junior High School. An examination of the records of pupils in these grades shows a remarkable range of differences in mental ability. In table IX is shown the distribution of pupils according to Intelligence Quotients derived from the Kuhlman-Anderson Intelligence Test as obtained by the writer from an examination of the pupils' records. In grade VII Intelligence quotients ranged from 69 to 122 with the median score 101. In grade VIII, the range extends from 68 to 148 with the median I. Q. 103. In grade IX, in a group of 308 pupils, the range extends from 71 to 149 with the median at 104.

TABLE IX
DISTRIBUTION OF PUPILS ACCORDING TO INTELLIGENCE
QUOTIENTS IN THE BELMONT (WASH.) JUNIOR HIGH
SCHOOL

Grade	65-75	75-85	85-115	115-135	135-155
Grade VII	9	136	184	80	3
" VIII	8	136	138	88	3
" IX	8	74	134	88	3
Total	25	336	456	156	9

These reports the results of classification of pupils about to enter grades VII-B of the Cleveland Junior High Schools in January, 1930. Preparatory to classification, the pupils

were given the Illinois Intelligence Test. The results were utilized by the junior high school principals in arranging them into VII-B groups of different ability as they entered the junior high school on January 31. The results of the test and the classification groups are given in table X.

TABLE X MEDIAN CLASS SCORES BY GROUPS AND DISTRIBUTION
BY GROUPS OF PUPILS ACCORDING TO SCORES ON
ILLINOIS INTELLIGENCE TEST IN GRADE VII-B
OF THE CLEVELAND JUNIOR HIGH SCHOOLS,
1920.¹⁰

<u>Illinois Intelligence</u> Score	Number of Classes	<u>Median</u> Class Score
82 and up	12	86
72-82	13	75
67-72	9	69
62-67	15	65
52-62	15	56
Below 62	10	48

After the results of the tests had been tabulated by classes. the records were arranged according to the class intelligence score. All classes with an intelligence score of 82 and up were placed in group I; between 72 and 82 in group II; Between 67 and 72 in group III; between 62 and 67 in group IV; Between 52 and 62 in group V; and below 52 in group VI. The score of the median class in group I was 86 with 12 classes represented ; in group II, 75, with 13 classes; 69 in group III with 9 classes; 65 in group IV, with 15 classes; 56 in group V, with 15 classes; and 48 in group VI, With 10 classes. Consider-
ing the two extremes we see that the score of the median class in

¹⁰Theisen, W. W. "The Relative Progress of VII-B groups Sectioned on the Basis of Ability" Journal of Educational Research 5:295-305. April, 1922. P.295

were given the Illinois Intelligence Test. The results were utilized by the Junior High School Principals in re-arranging them into VII-B groups of different ability as they entered the Junior High School on January 31. The results of the test and the classification groups are given in table X.

TABLE X
MEDIAN CLASS SCORES BY GROUPS AND DISTRIBUTION
BY GROUPS OF PUPILS ACCORDING TO SCORES ON
ILLINOIS INTELLIGENCE TEST IN GRADE VII-B
OF THE CLEVELAND JUNIOR HIGH SCHOOLS
1930-31

Illinois Intelligence Score	Number of Classes	Class Score
83 and up	13	86
73-82	13	75
67-72	9	68
63-67	15	65
53-62	12	58
Below 53	10	48

After the results of the tests had been tabulated by classes, the records were arranged according to the class intelligence score. All classes with an intelligence score of 83 and up were placed in group I; between 73 and 82 in group II; between 67 and 72 in group III; between 63 and 67 in group IV; between 53 and 62 in group V; and below 53 in group VI. The score of the median class in group I was 86 with 13 classes represented; in group II, 75, with 13 classes; 68 in group III with 9 classes; 65 in group IV, with 15 classes; 58 in group V, with 12 classes; and 48 in group VI, with 10 classes. Considering the two extremes we see that the score of the median class in

10
Thurman, W. W. "The Relative Progress of VII-B Groups and
Grouped on the Basis of Ability" Journal of Educational Research
2: 398-403, April, 1932, p. 398

group 1 is, therefore, twice that of the score in the lowest group.

In September, 1924, the Otis Classification Test was given to all children entering the public schools of Chicago, for the purpose of classifying the pupils into homogeneous groups. Table XI shows the distribution of pupils in grades VII and VIII. In grade VII-B, the scores range from 0 to 170 and in the other grades from 0 to 160. This represents a score in grade level from second grade to senior high school.

TABLE XI DISTRIBUTION OF JUNIOR HIGH SCHOOL PUPILS ACCORDING TO SCORES ON THE OTIS CLASSIFICATION TEST.
SEPTEMBER, 1924¹¹

Classification Score	VII-A	VII-B	VIII-A	VIII-B
170	1			
160	1	2	3	8
150	11	9	15	18
140	9	18	38	55
130	34	49	79	70
120	46	75	112	113
110	85	114	139	128
100	180	162	199	105
90	202	137	188	84
80	214	163	123	63
70	180	104	62	58
60	157	105	45	33
40	111	75	30	18
40	60	20	12	4
30	30	20	5	2
20	21	5	4	1
10	2	3	2	8
0	2	3	3	2

¹¹Keener, E. E. "Results of Homogeneous Classification of Junior High School Pupils." Journal of Educational Research 14:14-20. Jan. 1926. p.15

group I is, therefore, twice that of the score in the low-
est group.

In September, 1934, the Otis Classification Test

was given to all children entering the public schools of

Chicago, for the purpose of classifying the pupils into

homogeneous groups. Table XI shows the distribution of

pupils in grades VII and VIII. In grade VII-B, the scores

range from 0 to 170 and in the other grades from 0 to 160.

This represents a score in grade level from second grade to

senior high school.

TABLE XI
DISTRIBUTION OF JUNIOR HIGH SCHOOL PUPILS ACCORD-
ING TO SCORES ON THE OTIS CLASSIFICATION TEST.
SEPTEMBER, 1934

Classification Score	VII-A	VII-B	VIII-A	VIII-B
170	1			
160	1	3	3	8
150	11	8	13	13
140	9	18	23	25
130	34	43	79	70
120	43	75	113	113
110	85	114	139	129
100	130	133	159	105
90	203	137	188	84
80	214	163	123	63
70	180	104	63	58
60	137	103	43	33
40	111	75	30	13
40	30	30	13	4
30	30	30	3	3
20	21	5	4	1
10	3	3	3	3
0	3	3	3	3

11 Keener, E. E. "Results of Homogeneous Classification
of Junior High School Pupils." Journal of Educational Re-
search 14:14-20. Jan. 1933. p. 18

In table XII is shown the range of intelligence quotients of pupils enrolled in the Isaac E. Young Junior High School of New Rochelle, N.Y. The range of I.Q.'s and the mode for each of 11 home-room sections are given together with the number of pupils in each section. The range of scores

TABLE XII DISTRIBUTION OF INTELLIGENCE QUOTIENTS ACCORDING
TO HOME ROOM IN GRADE IX OF THE I.E. YOUNG
(NEW ROCHELLE, N.Y.) JUNIOR HIGH SCHOOL,
1929-30¹²

<u>Section Number</u>	<u>Enrollment</u>		<u>Probable Mode</u>	<u>Learning Rate (I. Q.) Range</u>
	Boys	Girls		
9-209	15	14	135	106-154
9-208	17	10	120	115-139
9-213	16	14	110	110-129
9-216	12	18	110	90-122
9-211	16	14	110	90-122
9-115	17	12	100	93-114
9-111	28	0	90	87-108
9-215	13	30	90	80-112
9-121	13	12	90	79-103
9-120	11	14	80	75-93
9-210	14	8	80	68-104

for the entire grade extends from 68 to 154 with a distribution, as indicated by the modes of the various sections, that is fairly regular. A comparison of the scores for this grade with those of grade IX of the Belmont Junior High School reveals a striking similarity both as to range and distribution. The intelligence quotients represented in table XII are those of pupils enrolled in junior high school during the school year 1929-30; while those

¹² Lyman, R. S. "Individualization in the Isaac E. Young Junior High School." School Review 39:257-71. April 1931

In table XII is shown the range of intelligence quotients of pupils enrolled in the Isaac E. Young Junior High School of New Rochelle, N.Y. The range of I.Q.'s and the mode for each of 11 home-room sections are given together with the number of pupils in each section. The range of scores

TABLE XII
DISTRIBUTION OF INTELLIGENCE QUOTIENTS ACCORDING
TO HOME ROOM IN GRADE IX OF THE I. E. YOUNG
(NEW ROCHELLE, N.Y.) JUNIOR HIGH SCHOOL,
1929-30

Section Number	Enrollment		Probable Learning Rate (I. Q.) Range
	Boys	Girls	
8-209	15	14	108-134
8-208	17	10	115-133
8-213	16	14	110-138
8-216	18	18	90-122
8-211	16	14	90-122
8-115	17	18	93-114
8-111	28	0	87-108
8-215	18	30	80-112
8-131	18	18	78-103
8-120	11	14	75-83
8-210	14	8	68-104

for the entire grade extends from 68 to 134 with a distribution, as indicated by the modes of the various sections, that is fairly regular. A comparison of the scores for this grade with those of grade IX of the Belmont Junior High School reveals a striking similarity both as to range and distribution. The intelligence quotients represented in table XII are those of pupils enrolled in Junior High School during the school year 1929-30; while those

of table IX are the scores of pupils enrolled in school for the year 1933-34. The considerable number of scores in the lower groups in both cases furnishes convincing evidence not only of the retentive power of the junior high school but also of the tendency of the differences in mental capacity between the group extremes to become greater as the school population grows.

The foregoing data illustrate the wide range of mental ability in the junior high school and demonstrate conclusively the problem of providing for this variation.

(d) Differences in Achievement

As might be expected, such great diversity in intellectual capacity is closely related to varying levels of achievement. Investigation has revealed wide variation in

TABLE XIII MEDIAN CLASS SCORES BY INTELLIGENCE GROUPS OF PUPILS IN GRADE VII-B OF THE CLEVELAND JUNIOR HIGH SCHOOLS IN THE (1) STONE ARITHMETIC (2) MONROE READING, AND (3) CHARTERS LANGUAGE TESTS, 1920¹³

Illinois Intelligence Score	Stone Arithmetic	Monroe Reading		Charters' Language
		Comprehension	Rate	
82 and up	7.0 (12)*	32.3 (11)	133 (10)	21.1 (12)
78-82	6.6 (13)	26.8 (13)	133 (10)	18.8 (12)
67-72	6.1 (9)	23.8 (8)	133 (7)	16.7 (8)
62-67	5.6 (15)	21.5 (12)	115 (9)	15.8 (12)
52-62	5.1 (15)	21.5 (12)	115 (8)	14.0 (14)
Below 62	4.6 (10)	18.0 (9)	101 (8)	15.8 (10)

*Figure in parentheses indicates number of classes represented

¹³Theisen, W. W. Op. cit. p.296

of table IX are the scores of pupils enrolled in school for the year 1933-34. The considerable number of scores in the lower groups in both cases furnishes convincing evidence not only of the tentative power of the junior high school but also of the tendency of the differences in mental capacity between the group extremes to become greater as the school population grows.

The foregoing data illustrate the wide range of mental ability in the junior high school and demonstrate conclusively the problem of providing for this variation.

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TABLE XIII
MEDIAN CLASS SCORES BY INTELLIGENCE GROUPS OF PUPILS IN GRADE VII-B OF THE CLEVELAND JUNIOR HIGH SCHOOLS IN THE (1) STONE WHITE METRIC (2) MONROE READING, AND (3) CHARTERS LANGUAGE TESTS, 1930-31

Intelligence Score	Stone Arithmetic		Monroe Reading		Charters Language
	Score	Percentage	Score	Percentage	
85 and up	7.0 (13)	33.3 (11)	133 (10)	13.3 (10)	31.1 (13)
78-83	6.6 (13)	33.3 (13)	133 (10)	13.3 (10)	18.8 (13)
67-77	6.1 (9)	33.3 (8)	133 (7)	13.3 (7)	16.7 (8)
63-67	5.6 (15)	31.5 (15)	115 (9)	11.5 (9)	15.3 (13)
53-63	5.1 (15)	31.5 (15)	115 (8)	11.5 (8)	14.9 (14)
Below 53	4.6 (10)	18.0 (9)	101 (8)	10.1 (8)	13.6 (10)

* Figures in parentheses indicate number of classes represented

the achievement of pupils in silent reading, arithmetic, reading comprehension, language comprehension, and vocabulary control. Theisen reports the results of classifying pupils into different VII-B groups on the basis of ability, in the Cleveland junior high schools. The pupils were given the Illinois Intelligence Test in January 1920. The results were utilized in classifying the pupils into sections on the basis of ability upon their entrance to the junior high school. In June of the same year the different sections were tested with the Stone Reasoning Test in arithmetic, the Monroe Reading Test, Form 11, and the Charters' Language Test. The median class score for each group is given in table XIII.

In arithmetic, the median class in the lowest intelligence group scored 7.0, a difference equivalent approximately to one and one-half years progress.. In reading, the median class of the lowest intelligence group scored 18.0 in comprehension and 101 in rate in contrast to 32.3 and 133 respectively for the median class of the brightest group of classes, a difference equivalent to more than two years of work. In language the scores made by the median classes were 13.8 for the lowest and 21.1 for the brightest intelligence group, a difference again equivalent to more than two years of progress.. Thus we see that the average class of highest intelligence was in no case less than three semesters ahead of

the achievement of pupils in silent reading, arithmetic, reading comprehension, language comprehension, and vocabulary control. The mean scores for the results of classification into different VII-3 groups on the basis of ability in the fivefold factor also appear. The pupils were given the Illinois Intelligence Test in January 1930. The results were utilized to classify the pupils into sections on the basis of ability upon which they traced to the Junior High School. In view of the nature of the different sections were tested with the Stone Reasoning Test in arithmetic, the Nonverbal Reading Test, Form 11, and the Character, Language Test. The median class score for each group is given in Table VIII.

In arithmetic, the median class in the lowest intelligence group scored 7.0, a difference equivalent approximately to one and one-half years progress. In reading, the median class of the lowest intelligence group scored 18.5 in comprehension and 101 in rate in contrast to 33.3 and 133 respectively for the median class of the highest group of classes, a difference equivalent to more than two years of work. In language the scores made by the median classes were 13.6 for the lowest and 31.1 for the highest intelligence group, a difference again equivalent to more than two years of progress. Thus we see that the average class of lowest intelligence was in no case less than three years retarded of

the average class in the lowest intelligence group.

Table XIV shows the range of achievement in silent reading and vocabulary control of pupils grouped into sections on the basis of intelligence in the Isaac E. Young Junior High School. In silent reading the Gates Silent Reading Test was used, and the Inglis and New Rochelle vocabulary tests were used to determine the proficiency of pupils in vocabulary control. The results show that the pu-

TABLE XIV RANGE AND MODE OF SCORES IN SILENT READING AND VOCABULARY CONTROL OF NINTH GRADE SECTIONS IN THE ISAAC E. YOUNG JUNIOR HIGH SCHOOL¹⁴

<u>Section Number</u>	<u>Enrollment</u>		<u>Silent Reading Score</u>		<u>Score in Test of Vocabulary Control</u>	
	Boys	Girls	Mode	Range	Mode	Range
9-209	15	14	11	9-11	12	9 to college
9-208	17	10	11	7-11	10	9 to college
9-213	16	14	10	7-11	9	9 to 12
9-216	12	19	8	7-11	9	7 to 11
9-211	16	14	8	7-11	9	7 to 11
9-115	17	12	9	6-10	8	6 to 10
9-111	28	0	5	4-6	7	5 to 10
9-215	13	30	9	6-10	9	6 to 10
9-121	13	12	8	5-11	8	5 to 11
9-120	13	12	7	7-11	8	6 to 20
9-210	14	8	1	4-9	7	4 to 11

pils' ability in silent reading ranged from the 4th to the 11th grade level, and in vocabulary control from the fourth grade to the college level.

A comparison of the results of the New Rochelle and Cleveland tests indicates that there is a strong tendency for

¹⁴Lyman, R. S. Op. cit. p. 259

the average class in the lowest intelligence group. Table XIV shows the range of achievement in silent reading and vocabulary control of pupils grouped into sections on the basis of intelligence in the Isaac E. Young Junior High School. In silent reading the Gates Silent Reading Test was used, and the Torrie and New Rochelle vocabulary tests were used to determine the proficiency of pupils in vocabulary control. The results show that the

TABLE XIV
RANGE AND MODE OF SCORES IN SILENT READING AND
VOCABULARY CONTROL OF NINTH GRADE SECTIONS
IN THE ISAAC E. YOUNG JUNIOR HIGH SCHOOL

Section Number	Enrollment		Silent Reading Score		Score in Test of Vocabulary Control	
	Boys	Girls	Mode	Range	Mode	Range
9-209	13	14	11	9-11	12	9 to college
9-208	17	10	11	7-11	10	9 to college
9-213	16	14	10	7-11	9	8 to 12
9-216	13	12	8	7-11	9	7 to 11
9-211	16	14	8	7-11	9	7 to 11
9-115	17	13	9	6-10	8	6 to 10
9-111	23	0	5	4-8	7	5 to 10
9-215	23	30	9	6-10	8	8 to 10
9-131	13	13	8	6-11	8	6 to 11
9-130	13	13	7	7-11	8	6 to 20
9-210	14	8	1	4-9	7	4 to 11

pupils' ability in silent reading ranged from the 4th to the 11th grade level, and in vocabulary control from the fourth grade to the college level.

A comparison of the results of the New Rochelle and Cleveland tests indicates that there is a strong tendency for

differences in achievement to become greater as pupils advance through the junior high schools.

(e) Interests, Tastes, and Aptitudes

That pupils vary widely in interests, tastes, and aptitudes has also been shown. The study of Clem and Malloy in which the individual differences of 776 pupils in the junior high school were ascertained by means of a questionnaire submitted to the pupils, disclosed a large variation in likes, interests, preferences, and future plans.

Table XV shows the future school plans of the pupils of the Roosevelt Junior High School. According to the

TABLE XV SHOWING FUTURE SCHOOL PLANS OF PUPILS OF THE
ROOSEVELT (SYRACUSE, N.Y.) JUNIOR HIGH SCHOOL¹⁵

Grade	School		Graduate		Central	Senior High		
	Next	Year	Yes	No		Vocational	North	Bus. College
	Yes	No	Yes	No				
VII-1	157	0	157	0	123	34	0	0
VII-2	123	16	120	19	116	4	0	0
VIII-1	140	11	127	24	63	46	10	8
VIII-2	121	35	116	40	75	37	0	4
IX-1	92	19	87	24	82	40	0	5
IX-2	53	9	57	5	52	5	0	0

table 85.5 per cent plan to graduate; 65.8 per cent plan to enter Central High School for senior work; 21.3 per cent plan to enter vocational school; 1.2 per cent plan to enter Senior High School; 2.1 per cent plan to go to business college.

¹⁵Clem, Orlie M. and Malloy, Kathie V. Op. cit. p.49

difference in achievement to become greater as pupils advance through the junior high schools.

(e) Interests, Tastes, and Attitudes

That pupils vary widely in interests, tastes, and attitudes has also been shown. The study of Class and Mail-Box in which the individual differences of 776 pupils in the junior high school were ascertained by means of a questionnaire submitted to the pupils, disclosed a large variation in likes, interests, preferences, and future plans. Table XV shows the future school plans of the pupils of the Roosevelt Junior High School. According to the

TABLE XV
SHOWING FUTURE SCHOOL PLANS OF PUPILS OF THE
ROOSEVELT (SYRACUSE, N.Y.) JUNIOR HIGH SCHOOL

Grade	School Next Year		Graduate		Gen- eral	Senior High Voca- tional	Senior High North Bur. College
	Yes	No	Yes	No			
VII-1	127	0	127	0	123	34	0
VII-2	123	16	120	19	116	4	0
VIII-1	140	11	127	24	63	46	10
VIII-2	121	35	118	40	75	37	0
IX-1	92	19	67	24	62	40	0
IX-2	32	9	27	3	22	2	0

Table 25.3 per cent plan to graduate; 65.6 per cent plan to enter Central High School for senior work; 21.3 per cent plan to enter vocational school; 1.3 per cent plan to enter Senior High School; 2.1 per cent plan to go to business college.

Table XVI shows the preferences of the same pupils for the various school subjects. Shop work, home-making, and mathematics are the most popular courses in terms of pupils likes and dislikes.

TABLE XVI SHOWING PREFERENCE OF PUPILS OF THE ROOSEVELT JUNIOR HIGH SCHOOL FOR SCHOOL SUBJECTS.¹⁶

Grade	Eng-lish	Sci-ence	Mu-sic	Math-ematics	So-cial Sci-ence	Lan-guage	Shop	Home Making
VII-1	23	3	23	82	16	0	32	43
VII-2	15	2	8	30	11	0	32	43
VIII-1	6	12	9	52	2	0	51	29
VIII-2	17	3	6	17	16	9	57	30
IX-1	11	20	2	9	0	0	32	37
IX-2	4	28	10	0	0	0	11	8

Table XVII indicates the pupils' preferences in extra-curricula activities. Eighty-one and seven-tenths

TABLE XVII SHOWING PREFERENCE FOR AND PARTICIPATION IN EXTRA-CURRICULA ACTIVITIES BY PUPILS OF THE ROOSEVELT JUNIOR HIGH SCHOOL¹⁷

Grade	Like Best				Take Part				
	As-sembly	Home Room	Pupil Govern-ment	Clubs	As-sembly	Home Room	Gov-ern-ment	Clubs	Or-ches-tra
VII-1	157	157	0	0	42	21	12	0	0
VII-2	139	139	0	0	21	37	18	3	0
VIII-1	100	140	0	0	46	52	26	6	9
VIII-2	96	60	0	0	17	42	30	11	12
IX-1	80	111	11	12	21	87	24	12	8
IX-2	62	50	0	0	30	52	38	14	3

¹⁶Clem, Orlie M. and Malloy, Kathie V. Op. cit. p. 49

¹⁷Clem, Orlie M. and Malloy, Kathie V. Op. cit. p.50

Table XVI shows the preferences of the same pupils for the various school subjects. Shop work, home-making, and mathematics are the most popular courses in terms of pupils likes and dislikes.

TABLE XVI
SHOWING PREFERENCES OF PUPILS OF THE ROOSEVELT JUNIOR HIGH SCHOOL FOR SCHOOL SUBJECTS, 1916

Grade	English	Science	Mathematics	History	Physical Education	Shop	Home Making
VII-1	23	3	23	15	0	32	43
VII-2	15	3	8	30	0	32	43
VIII-1	8	12	9	22	0	21	29
VIII-2	17	3	6	17	9	27	30
IX-1	11	20	2	9	0	32	37
IX-2	4	28	10	0	0	11	8

Table XVII indicates the pupils' preferences in extra-curricular activities. Eighty-one and seven-tenths

TABLE XVII
SHOWING PREFERENCE FOR AND PARTICIPATION IN EXTRA-CURRICULAR ACTIVITIES BY PUPILS OF THE ROOSEVELT JUNIOR HIGH SCHOOL, 1916

Grade	As- sem- bly	Home Room	Gov- ern- ment	As- sem- bly	Home Room	Gov- ern- ment	Or- ches- tra
VII-1	127	127	0	43	21	12	0
VII-2	129	129	0	21	37	18	0
VIII-1	100	140	0	48	28	28	9
VIII-2	88	60	0	17	42	30	12
IX-1	80	111	11	21	67	24	8
IX-2	62	20	0	30	22	38	3

¹⁶Clem, Orille M. and Malloy, Kathie V. Op. cit. p. 42

¹⁷Clem, Orille M. and Malloy, Kathie V. Op. cit. p. 50

per cent prefer assembly; 84.6 per cent enjoy the home room meetings. 22.8 per cent have appeared on assembly programs; 37.5 per cent have taken active part in the home-room activities; 4.7 per cent have played in the orchestra.

Table XVIII shows the number of pupils who work outside school; the kinds of work they do, and their average earnings per week. Seventy and three-tenths per cent do some work at home; 20.6 per cent work outside the home; 24.6 per cent help with the dishes; 11.2 per cent sweep; 27.2 per cent run errands; 9.5 per cent sell papers; 4.6 per cent work in stores; 11.8 per cent clean walks; 7.9 per cent care for babies. The earnings of the pupils range from fifty cents to five dollars per week.

TABLE XVIII SHOWING KINDS OF WORK OUTSIDE SCHOOL AND EARNINGS PER WEEK OF PUPILS OF ROOSEVELT JUNIOR HIGH SCHOOL¹⁸

Kinds of Work	VII-1	VII-2	VIII-1	VIII-2	IX-1	IX-2
Work at home	97	83	123	113	72	57
For Some one else	22	37	26	17	36	22
Dishes	32	27	32	78	47	33
Sweep	10	16	10	12	22	17
Errands	35	10	36	52	40	38
Papers	12	8	9	17	16	12
Store	3	5	6	10	8	4
Clean Walks	0	10	21	20	14	27
Care of babies	5	7	9	13	12	16

Earnings per Week (average) with Number of Pupils Below						
\$.50	\$.75	\$1.00	\$1.25	\$1.50	\$1.75	\$2.00
42	60	45	23	57	12	38
\$2.75	\$3 .25	\$3.50	\$4.00	\$4.50	\$5.00	
82	60	12	5	13	32	

¹⁸Clem, Orlie M. and Malloy, Kathie U. Op. cit. p. 52

per cent prefer assembly; 84.6 per cent enjoy the home room meetings. 32.8 per cent have appeared on assembly programs; 37.5 per cent have taken active part in the home-room activities; 4.7 per cent have played in the orchestra.

Table XVII shows the number of pupils who work outside school; the kinds of work they do, and their average earnings per week. Seventy and three-tenths per cent do some work at home; 30.6 per cent work outside the home; 34.6 per cent help with the dishes; 11.3 per cent sweep; 27.3 per cent run errands; 9.6 per cent sell papers; 4.6 per cent work in stores; 11.8 per cent clean walks; 7.8 per cent care for babies. The earnings of the pupils range from fifty cents to five dollars per week.

TABLE XVII
SHOWING KINDS OF WORK OUTSIDE SCHOOL AND EARNINGS PER WEEK OF PUPILS OF ROOSEVELT JUNIOR HIGH SCHOOL

Kinds of Work	VII-1	VII-2	VIII-1	VIII-2	IX-1	IX-2
Work at home	97	85	133	113	78	57
For some one else	83	37	38	17	36	33
Dishes	32	27	33	78	47	33
Sweep	10	18	10	13	33	17
Errands	35	10	36	33	40	33
Papers	12	8	9	17	18	13
Store	3	5	6	10	8	4
Clean Walks	0	10	21	30	14	27
Care of babies	5	7	9	13	13	16
Earnings per Week (average) with Number of Pupils Below						
\$1.50	75	\$1.00	\$1.25	\$1.50	\$1.75	\$2.00
42	80	42	33	27	13	33
\$2.75	35	\$2.50	\$2.00	\$1.50	\$2.00	
83	60	13	5	13	33	

1801, Orlin W. and Nellie W. Katis W. Co. of p. 33

(f) Differences in Environment and Background

"Environmental differences", states Koos,¹⁹ "are also believed to be potent in making for variation between individuals of identical native endowment. Among these environmental influences are the kind of previous education in school, home conditions, inclusive of intellectual traditions, occupations, and recreational and other interests of members of the family; and neighborhood surroundings. These are, in turn, determined in no small part by what are sometimes referred to as "race differences" especially in cities whose populations are constituted in considerable proportions of recent immigration of peoples whose traditions and attitudes are notably unlike those of peoples who came to our shores a generation or more ago."

Undoubtedly, these environmental factors, especially racial differences, will vary greatly according to the location of the school, especially in larger cities where people are inclined to settle in sections inhabited largely by people of their own nationality. In most cities, however, it is probable that pupils are somewhat evenly divided in the junior high school according to racial and economic background.

In the following tables various differences of environment and background of the pupils of the Roosevelt Junior High School as determined by Clem and Malloy are shown.

In Table XIX are shown the occupations of the parents of these pupils. When these occupations are grouped

¹⁹ Koos, Leonard V. Opp. Cit. p.47

(1) Differences in Environment and Background

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In the following tables various differences of en-vironment and background of the pupils of the Roosevelt Jun-ior High School as determined by Cies and Malloy are shown. In Table XIX are shown the occupations of the parents of these pupils. When these occupations are grouped

TABLE XIX OCCUPATIONAL STATUS OF PARENTS OF PUPILS OF
ROOSEVELT JUNIOR HIGH SCHOOL²⁰

Occupation	VII-1	VII-2	VIII-1	VIII-2	IX-1	IX-2
Musician	1	5	0	0	0	0
Artist	0	2	0	0	0	0
Dentist	0	0	0	0	0	0
Preacher	2	2	0	2	2	1
Architect	1	0	1	1	0	0
Civil Engineer	0	0	0	2	2	1
Banker	0	0	1	1	1	0
Telegrapher	0	0	0	1	1	0
Auditor	0	0	0	1	1	0
Foreman	6	10	8	1	1	0
Railroad	12	8	5	10	2	2
Fireman	2	3	10	8	0	1
Policeman	1	2	1	1	0	0
Business	10	28	10	9	0	0
Shop	5	20	30	14	0	0
Engineer	5	4	4	0	0	1
Trucking	4	9	8	0	1	0
Picture Show	1	0	0	0	0	0
Pool Parlor	1	0	0	0	0	0
Contractor	13	10	0	10	4	2
Tailor	3	0	0	0	1	0
Mail Carrier	0	0	0	1	2	2
Insurance	10	8	0	5	2	2
Real Estate	9	5	0	10	10	0
Electrician	3	4	1	0	3	0
Taxi-Driver	3	0	2	4	0	0
Janitor	1	1	1	1	1	0
Pharmacist	2	1	1	0	1	0
Salesman	8	10	8	9	5	5
Barber	9	1	5	4	0	0
Butcher	3	0	2	5	1	0
Mechanic	11	1	12	11	9	4
Carpenter	13	0	20	12	7	8
Mason	3	0	5	5	2	0
Printer	6	0	10	10	4	3
Tinsmith	2	0	2	5	0	0
Occupation of Mother						
Housekeeper	134	100	121	109	84	28
Business	3	11	3	5	2	4
Teacher	1	2	5	7	3	3
Teacher (music)	0	2	5	3	2	2
Artist	0	0	0	1	1	0
Nurse	44	8	6	8	7	6
Beauty Parlor	3	2	2	4	2	2
Dressmaker	3	11	9	8	5	8
Store	9	3	3	5	4	8
Real Estate	0	0	2	1	1	1

²⁰ Clem, Orlie M. and Malloy, Kathie V. Op.cit. pp.43-45

TABLE XIX OCCUPATIONAL STATUS OF PARENTS OF PUPILS OF
ROOSEVELT JUNIOR HIGH SCHOOL

Occupation	VII-1	VII-2	VIII-1	VIII-2	IX-1	IX-2
Musician	1	2	0	0	0	0
Artist	0	2	0	0	0	0
Dentist	0	0	0	0	0	0
Preschooler	2	2	0	2	2	1
Architect	1	0	1	1	0	0
Civil Engineer	0	0	0	2	2	1
Banker	0	0	1	1	1	0
Telegrapher	0	0	0	1	1	0
Auditor	0	0	0	1	1	0
Foreman	2	10	2	1	1	0
Railroad	12	2	10	2	2	2
Fireman	2	2	10	2	0	1
Policeman	1	2	1	1	0	0
Business	10	22	10	2	0	0
Shop	2	20	20	14	0	0
Engineer	2	4	4	0	0	1
Trucking	4	2	2	0	1	0
Picture Show	1	0	0	0	0	0
Pool Parlor	1	0	0	0	0	0
Contractor	12	10	0	10	4	2
Tailor	3	0	0	0	1	0
Mail Carrier	0	0	0	1	2	2
Insurance	10	2	0	2	2	2
Real Estate	2	2	0	10	10	0
Electrician	3	4	1	0	3	0
Taxi-Driver	3	0	2	4	0	0
Janitor	1	1	1	1	1	0
Pharmacist	2	1	1	0	1	0
Salesman	2	10	2	2	2	2
Barber	2	1	2	4	0	0
Butcher	2	0	2	2	1	0
Mechanic	11	1	12	11	2	4
Carpenter	12	0	20	12	7	2
Mason	2	0	2	2	2	0
Printer	2	0	10	10	4	2
Timber	2	0	2	2	0	0
Occupation of Mother						
Homemaker	124	100	121	102	84	22
Business	2	11	2	2	2	4
Teacher	1	2	2	7	2	2
Teacher (music)	0	2	2	2	2	2
Artist	0	0	0	1	1	0
Nurse	44	2	2	2	7	2
Beauty Parlor	2	2	2	4	2	2
Dressmaker	2	11	2	2	2	2
Store	2	2	2	2	4	2
Real Estate	0	0	2	1	1	1

into classes designated as professional, business and industrial occupations, we find 60 men and 37 women engaged in professional work; 191 men and 33 women engaged in business occupations; and 487 men and 198 women occupied in industry.

Table XX shows the nationality of the parents of the pupils of the Roosevelt Junior High Schools.

TABLE XX NATIONALITY OF PARENTS OF PUPILS OF THE ROOSEVELT JUNIOR HIGH SCHOOLS²¹

(a) Father						
Nationality	VII-1	VII-2	VIII-1	VIII-2	IX-1	IX-2
American	144	120	118	133	102	58
Italian	5	8	12	6	4	2
Canadian	3	5	6	5	2	2
Polish	2	4	2	4	1	0
Hungarian	1	0	1	0	1	0
Russian	2	2	0	2	0	0
Brazilian	0	0	0	1	1	0
Hollander	0	0	0	0	1	0
(b) Mother						
Nationality	VII-1	VII-2	VIII-1	VIII-2	IX-1	IX-2
American	144	120	118	133	102	58
Italian	5	8	12	6	4	2
Canadian	3	5	6	5	2	2
Polish	2	4	2	4	1	0
Hungarian	1	0	1	0	0	0
Russian	2	2	0	2	0	0
Greek	0	0	0	1	1	0
Hollander	0	0	0	0	1	0

The fathers of 674 pupils or 86.6 per cent of the total enrollment are American, 675 or 86.9 per cent of the mothers are American. According to Lyman²² the pupils of the I. E. Young Junior High School of New Rochelle, N. Y.

²¹Clem, Orlie M. and Malloy, Kathie V. Op. cit. p. 42

²²Lyman, R. S. Op. cit. p.256

into classes designated as professional, business and in-
dustrial occupations, we find 60 men and 37 women engaged
in professional work; 191 men and 33 women engaged in bus-
iness occupations; and 487 men and 188 women occupied in
industry.

Table XX shows the nationality of the parents of
the pupils of the Roosevelt Junior High School.

TABLE XX NATIONALITY OF PARENTS OF PUPILS OF THE ROOSE-
VELT JUNIOR HIGH SCHOOL³¹

Nationality	(a) Father					(b) Mother				
	VII-1	VII-2	VII-1	VII-2	VII-3	VII-1	VII-2	VII-1	VII-2	VII-3
American	144	120	118	133	103	144	120	118	133	103
Italian	5	8	13	6	4	5	8	13	6	4
Canadian	3	5	6	5	3	3	5	6	5	3
Polish	3	4	3	4	1	3	4	3	4	1
Hungarian	1	0	1	0	1	1	0	1	0	1
Russian	3	3	0	3	0	3	3	0	3	0
Brazilian	0	0	0	1	1	0	1	1	1	1
Hollander	0	0	0	0	1	0	0	0	1	1

The fathers of 674 pupils or 88.6 per cent of the
total enrollment are American, 675 or 88.9 per cent of the
mothers are American. According to Lyman³² the pupils of
the I. E. Young Junior High School of New Rochelle, N. Y.

³¹ Glen, Orlie M. and Malloy, Kathie V. Op. cit. p. 43
³² Lyman, R. S. Op. cit. p. 256

come from widely varying social constituencies, ranging from families of prosperous New York business men and professional people to families of Italian and negro laborers. Approximately 20 per cent of the pupils are Italian children born in America of immigrant parents. The others are of native American stock.

These two examples illustrate the fact that the racial background of the pupils of each school is somewhat different, but the degree of difference and the particular nationalities represented are peculiar to the section of the country and to the location of the school.

Table XXI shows the education of the parents of the pupils of the Roosevelt Junior High School. One hundred

TABLE XXI EDUCATION OF PARENTS OF PUPILS OF THE ROOSEVELT JUNIOR HIGH SCHOOL²³

<u>Grade</u>	<u>Not Ele-</u> <u>mentary</u>		<u>Ele-</u> <u>mentary</u>		<u>High</u>		<u>College</u>		<u>Normal</u>		<u>Business</u> <u>College</u>	
	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.
VII-1	8	20	97	104	30	23	5	2	0	8	7	0
VII-2	17	36	54	75	40	20	8	2	0	6	20	0
VIII-1	20	32	53	67	57	46	5	2	0	5	16	0
VIII-2	14	11	59	83	63	52	9	6	0	4	11	0
IX-1	18	20	53	69	20	18	12	2	0	2	8	0
IX-2	5	12	10	23	30	20	8	4	0	3	9	0

and thirty-one or 16.8 per cent of the mothers have not finished the elementary school, and 82 or 10.5 per cent of the fathers have not. One hundred and seventy-nine or 23 per cent of the

²³. Clem, Orlie M. and Malloy, Kathie V. Op. cit. P. 43

come from widely varying social constitutions, ranging from families of prosperous New York business men and professional people to families of Italian and negro laborers. Approximately 30 per cent of the pupils are Italian children born in America of immigrant parents. The others are of native American stock.

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TABLE XXI EDUCATION OF PARENTS OF PUPILS OF THE ROOSEVELT JUNIOR HIGH SCHOOL²³

Grade	Not Ele- mentary		Ele- mentary		High		College		Normal		Business College	
	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.
VII-1	8	20	97	104	30	23	2	2	0	8	7	0
VII-2	17	36	54	75	40	30	8	3	0	6	20	0
VIII-1	20	32	53	67	57	48	2	2	0	2	18	0
VIII-2	14	11	59	83	53	53	6	6	0	4	11	0
IX-1	18	20	53	69	20	18	12	3	0	2	8	0
IX-2	5	12	10	23	30	20	8	4	0	3	9	0

and thirty-one or 16.8 per cent of the mothers have not finished the elementary school, and 82 or 10.5 per cent of the fathers have not. One hundred and seventy-nine or 33 per cent of the

²³ Clem, Otis M. and Malloy, Kathie V. Op. cit. p. 43

mothers have a high school education; 240 or 30.9 per cent of the fathers; 18 or 2.3 per cent of the mothers have been to college; 47 or 6 per cent of the fathers; 28 or 3.6 per cent of the mothers are normal graduates; 81 or 10.4 per cent of the fathers are graduates of business college. On the whole the fathers have had more education than the mothers.

In this school, also, 140 or 18 per cent of the pupils attend the movies; 434 or 55.9 per cent average once a week; 142 or 18.2 per cent average twice a week. Three-hundred forty-seven or 44.7 per cent do not attend other theaters; 259 or 33.3 per cent average once per month; 145 or 18.6 per cent twice each month; 28 or 3.6 per cent three times each month. two hundred forty-six or 31.7 per cent do not attend musicals; 376 or 48.4 per cent average once per term; 131 or 16.8 per cent twice per term; 21 or 2.7 per cent three times per term.²⁴

Five hundred and fifty-one or 71 per cent of the pupils have a library of some character in their homes. Four hundred and ninety-eight claim to be fond of reading. One hundred and seventy-one or 22 per cent procure books from the public library; 461 or 59.4 per cent use the books in the school library.²⁵

Six hundred and seventy-six or 87.1 per cent of

²⁴ Clem, Orlie M. and Malloy, Kathie V. Op.cit. p. 45

²⁵ Clem, Orlie M. and Malloy, Kathie V. Op. cit. p.47

the pupils do some home study. Two hundred and sixty-two or 33.7 per cent receive help at home; from father 13.7 per cent; from mother 60.3 per cent; from sister 12.2 per cent; from brother 6.1 per cent; from aunt 4.1 per cent; from uncle 3.4 per cent. Six hundred and ninety-four find conditions at home favorable to study.²⁶

A summary of the foregoing data may be expressed in the following observations. In each grade of the junior high school a few pupils differ in age by as many as 5 years. A substantial number of pupils will be found in the groups differing in age by two years. These differences in age have been shown by reliable investigators to be accompanied by corresponding differences in height, weight, and physiological development. There are substantial groups in each grade differing in height by 6, 8, or more inches and proportionately in weight. In the same grade may be found many pupils who are in advanced stages of adolescence, while others will not enter upon that period of development for several years.

In mental capacity also there is great variation. There are a few pupils in each grade in the very dull category, and also a few who are classified as near genius. Considerable numbers of pupils are found in the below average and above average groups.

²⁶Clem, Orlie M. and Malloy, Kathie V. Op. cit. p.49

the pupils do some home study. Two hundred and sixty-two or 33.7 per cent receive help at home; from father 13.7 per cent; from mother 20.3 per cent; from sister 13.3 per cent; from brother 8.1 per cent; from aunt 4.1 per cent; from uncle 3.4 per cent. Six hundred and ninety-four find con-

ditions at home favorable to study. 58

A summary of the foregoing data may be expressed in the following observations. In each grade of the Junior high school a few pupils differ in age by as many as 3 years. A substantial number of pupils will be found in the groups differing in age by two years. These differences in age have been shown by reliable investigators to be accompanied by corresponding differences in height, weight, and physical development. There are substantial groups in each grade differing in height by 3, 4, or more inches and proportionately in weight. In the same grade may be found many pupils who are in advanced stages of adolescence, while others will not enter upon that period of development for several years.

In mental capacity also there is great variation. There are a few pupils in each grade in the very dull category, and also a few who are classified as near genius. Considerable numbers of pupils are found in the below average and above average groups.

In achievement the pupils in the lowest group in each grade are exceeded by those in the highest groups by amounts varying from 3 to 8 semesters of progress, depending upon the grade and the subject. The differences are greater in the ninth than in the seventh and eighth grades. Pupils also show a wide variety of tastes, interests, and aptitudes. These vary from a liking for certain school subjects, to individual preferences for various extra-curricula activities. Many pupils plan to enter senior high school; fewer plan to enter vocational and business schools.

A wide variation in the environment and background of pupils is found. The majority of pupils come from families whose parents are engaged in commercial, industrial, or common occupations. The pupils in the majority of cases manifest a tendency to seek an education fitting them for an economic and social position superior to that of their parents. Many pupils work outside the school in a variety of occupations; most of these are jobs requiring a relatively small portion of their time. Many pupils also receive help on their lessons at home, and most of them have a home environment reasonably conducive to their educational development.

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observations to the effect that heterogeneous classes showed some undesirable situations. Bright pupils laughed at dull ones. Dull pupils seldom participated, and when doing so showed lack of assurance.

28

An investigation was conducted by Turney and Hyde in an attempt to find out from junior high school pupils their attitudes toward ability grouping as it was practiced in the school they attended in Lawrence, Kansas. The study involved 645 pupils in grades VII-A, VIII-A, VIII-B, IX-A, and IX-B in the junior high school, who were divided into three or four sections for each grade on the basis of intelligence quotients from the Stanford-Binet individual examinations supplemented by elementary school marks, by the judgment of the elementary school teachers, and by one or more achievement tests.

To these 645 pupils, the following questions were submitted:

- "1. Have your parents ever urged you to try to be placed in another group?
2. Has your teacher ever urged you to work harder in order that you could be placed in a higher group?
3. Has your teacher ever urged you to do better work because you are not doing as well as you could?
4. Has your teacher ever suggested that you were working too hard?

28. Turney, Austin H. and Hyde, M. F. The Attitude of Junior High School Pupils Toward Ability Grouping. School Review 39:597-607. Oct. '31.

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23. Turney, Annie H. and Hyde, M. E. The Attitudes of Junior High School Pupils Toward Ability Grouping. School Review 38:587-607. Oct. 1931.

CHAPTER IV

ABILITY GROUPING IN THE JUNIOR HIGH SCHOOL

The wide range of differences that have been shown in the previous chapter to exist in the junior high school is convincing evidence of the necessity of providing for them. To do this an enlarged list of courses, and a varied program of activities must be furnished by the school. Technical and practical arts courses, clubs, such as musical or art clubs, athletic and physical education programs are all necessary if the school is properly to perform this function. The problem, however, that has furnished the most difficulty to junior high school administrators is concerned with the best means to be used in recognizing differences in learning capacity or mental ability. Many plans and techniques have been proposed and many are being employed as the best means of solving this problem. Billet¹ lists 28 different provisions in use in secondary schools of the United States for recognizing individual differences in 1932. From this long list, the following may be mentioned as being most frequently used or more adequate for this pur-

¹Billet, Roy O. Op. cit. p.9

CHAPTER IV

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The wide range of differences that have been shown in the previous chapter to exist in the Junior High School is convincing evidence of the necessity of provision for them. To do this an enlarged list of courses, and a varied program of activities must be furnished by the school. Technical and practical arts courses, drama, such as music, and on art class, athletic and physical education programs are all necessary if the school is properly to perform this function. The problem, however, that has furnished the most difficulty to Junior High School administrators is concerned with the best means to be used in recognizing differences in learning capacity or mental ability. Many plans and techniques have been proposed and many are being employed as the best means of solving this problem. Elliot lists 23 different procedures in use in secondary schools of the United States for recognizing individual differences in 1938. From this long list, the following may be mentioned as being most frequently used or more appropriate for this purpose.

pose: (1) Variation in number of subjects a pupil may carry. (2) Special coaching of slow pupils. (3) Problem method. (4) Differentiated assignments. (5) Homogeneous or ability grouping. (6) Special classes for pupils who have failed. (7) Long unit assignments. (8) Contract plans. (9) Vocational guidance through exploratory courses. (10) Educational guidance through exploratory courses. (11) Morrison plan. (12) Dalton Plan. (13) Individualized instruction. (14) Winnetka technique.

The same writer has reduced the list of 28 provisions mentioned above to seven categories, namely, (1) homogeneous grouping, (2) special classes (3) plans characterized by the unit assignment, (4) scientific study of problem cases (5) variation in pupil load, (5) variation in pupil load, (6) out of school projects and studies, (7) advisory or guidance programs.

"Of the seven", states Billet, the first three--homogeneous grouping, special classes, and the unit assignment--have been found to be core elements in a typically successful program to provide for individual differences. These three form a kind of trinity, a sort of three-in-one answer to the Nation's outstanding schools to the problem of providing for individual differences. There is no evidence that, intrinsically, these three plans are alternative rather than complementary procedures." ²

Koos lists the following³ among provisions for individual differences in the junior high school, as the more im-

² Billet, Roy O. Op. cit. p.11

³ Koos, Leonard O. Op. cit. p.329

poses: (1) Variation in number of subjects a pupil may carry. (2) Special coaching of slow pupils. (3) Problem method. (4) Differentiated assignments. (5) Homogeneous or ability grouping. (6) Special classes for pupils who have failed. (7) Long unit assignments. (8) Contract plans. (9) Vocational guidance through exploratory courses. (10) Educational guidance through exploratory courses. (11) Variation plan. (12) Dalton Plan. (13) Individualized instruction. (14) Winnetka technique.

The same writer has reduced the list of 28 provisions mentioned above to seven categories, namely, (1) homogeneous grouping, (2) special classes (3) plans characterized by the unit assignment, (4) scientific study of problem cases, (5) variation in pupil load, (6) variation in pupil load, (6) out of school projects and studies, (7) advisory or guidance programs.

"Of the seven," states Elliot, the first three--homogeneous grouping, special classes, and the unit assignment--have been found to be core elements in a typically successful program to provide for individual differences. These three form a kind of trinity, a sort of three-in-one answer to the Nation's outstanding schools to the problem of providing for individual differences. There is no evidence that, intrinsically, these three plans are alternative rather than complementary procedures." 2

Koos lists the following among provisions for individual differences in the junior high school, as the more im-

portant: (1) modification of admission requirements to the seventh grade, (2) special plans and rates of promotion, (3) directed or supervised study, (4) contract or "unitary" plans which permit the pupil to move forward at a rate best suited of ability , (5) Winnetka and Dalton Plans, (6) remedial classes and similar provisions, and (7) ability grouping.

Ability grouping, as Koos further states,⁴ is an especially advantageous feature of junior high schools since it is highly important for seven of its functions and important for two others.

Turning to the specific functions, elimination⁵ will be reduced, continues this writer, since those pupils who were discouraged by competition with more capable pupils and continuous failure will be more content in groups suited to their ability and will be retained in school. Economy of time will be encouraged by the advancement of pupils more nearly in accordance with their respective abilities to progress. Exploration and guidance is encouraged through making it possible to focus attention on the abilities and characteristics of pupils in each group, and thereby the better to ascertain their needs present and future.

⁴. Koos, Leonard V. Op. cit. p. 54
⁵ Koos, Leonard V. Op. cit. p. 334

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4. Koos, Leonard V. Op. cit. p. 54
5. Koos, Leonard V. Op. cit. p. 334

Because the low groups contain the largest number of average pupils, and, hence, of pupils farthest along in physiological development, a greater recognition of adolescent nature will be secured. Because homogeneous grouping stimulates brighter pupils to better performances and encourages slower pupils, the basis for better scholarship is laid. The narrower range of abilities represented in homogeneous groups makes it much more nearly possible to adopt methods and content to less-than-average, average, and superior pupils, and thus provides the conditions for better teaching. Homogeneous grouping should make for a wholesome disciplinary situation, since the brighter pupils will be more completely engrossed by competition only with their peers, while slower pupils, being sectioned with other pupils like themselves, will be removed from a situation which is provocative of the untoward behavior which is their only means of securing self-realization in heterogeneous groups.

The primary purpose for which homogeneous or ability grouping was introduced into the junior high was, of course, the recognition of individual differences. Indeed,⁶ Briggs shows that 27.9 per cent of a number of judges whom he consulted approved of homogeneous grouping as an essential feature of the junior high school and 69.2 per cent

⁶Briggs, Thomas H. Op. cit. p.55

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approved of it as desirable for this purpose. Nevertheless, homogeneous grouping has not been without its opponents.⁷ Burr, particularly, made a study purporting to show the large amount of "overlapping" in homogeneous groups and hence the fallacy of the procedure. With regard to this study, Douglass says:

"The conclusion which should be made from this study of Burr is not different from that arrived at by many students of the phenomenon of overlapping in "homogeneous groups", namely, that while completely homogeneous groups are not things of possible realization, groups may be constructed of materially less heterogeneity than the typical heterogeneous class section".⁸

Other objections to homogeneous grouping are that it is undemocratic, that it places a stigma upon the slower pupils, that it has not been shown that pupils profit more when taught in homogeneous rather than heterogeneous groups, that it is impossible to differentiate the work for different groups, and that administrative difficulties are greatly increased.

Because of the nature of these objections it is difficult to dispose of them.⁹ Turney states after a review of the literature that "the experimental literature indicates that more often than not pupils do better in homogeneous groups than in heterogeneous groups."

⁷ Burr, Marvin Y. A Study of Homogeneous Grouping. Contributions to Education. No. 457. New York, Teachers College. Columbia University. 1931

⁸ Douglass, Harl A. Op.cit. p. 349

⁹ Turney, Austin H. "The Status of Ability Grouping" Ed. Administration and Supervision 17:21-42 110-127. Jan-Feb. '31

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⁸ Douglas, Earl A. Op. cit. p. 346.

⁹ Turney, Austin R. "The Status of Ability Grouping." Ed. Administration and Supervision 17:31-43. Jan-Feb. '31.

Freeman argues¹⁰ that the objections to grouping based on the grounds that it is undemocratic and places a stigma on the pupils are unjustified. The objections that grouping pupils according to ability creates administrative difficulties raises the question whether any plan seeking to provide for individual differences will not create the same or even greater difficulties.

Regardless of objections raised against it, homogeneous grouping is the most widely used method of providing for individual differences in the junior high school. From a total of 614 junior high schools to which Billet sent inquiries, 496 or almost 80 per cent reported the use of this plan. A consideration of such wide-spread use of ability grouping justifies further study of it in connection with the junior high school. In the remainder of this chapter, therefore, we shall consider this plan from the standpoint of (a) bases of grouping, (b) Mode of procedure in grouping, (c) attitudes toward grouping, and (d) practices in connection with grouping.

1. Bases of Grouping

¹¹Dvorak found in 1922 that of 86 junior high schools to which he had sent inquiries less than half were

¹⁰Freeman, Frank N. "Sorting the Students" Ed. Review. Nov. 1924. 68:169

¹¹Dvorak, August H. "Recognition of Individual Differences in the Junior High School." School Review 30:679-685. p.180 Nov.1922

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Bases of Grouping

Dvorak found in 1932 that of 86 junior high schools to which he had sent inquiries less than half were

¹⁰ Freeman, Frank W. "Sorting the Students" Ed. Review Nov. 1934. 68:169

¹¹ Dvorak, August H. "Recognition of Individual Differences in the Junior High School." School Review 30:673-685. p.180 Nov.1932

using "scientific" methods. The question may well be asked, "What are scientific methods?" In this connection the term is generally taken to mean the sectioning of pupils according to methods and upon bases that have proved most accurate in placing pupils in groups most nearly suited to their ability. It has not yet been decided which methods and which bases or combination of bases is best for this purpose. However, several experiments have been undertaken in an attempt to answer this question. One of the more important of these was the study of Brooks,¹² who investigated the comparative value of several bases for sectioning pupils according to ability in grade VII of a Baltimore junior high school. To a class of 93 pupils beginning the work of the junior high school, nine group intelligence tests and five achievement tests were given. The group intelligence tests in the order in which they were given were: Miller, Form A; Otis Self-Administering; Illinois, Form A; Terman Group Test, Form A; Haggerty Delta 2; National Intelligence Test, A; Dearborn Revised C and D; and the Pintner Non-Language Test. The achievement tests, also in the order in which they were given are; Thorndike McCall Reading, Form 3; Kelley, Trabue Language, Completion Alpha; Holley Sentence Vocabulary, a group vocabulary test consisting of the first

¹²Brooks, Fowler D. "Sectioning Junior High School Pupils by Tests and School Marks." Journal of Ed. Research. 12:359-69 Dec. 1925

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ley, First Language, Completion Alpha; Kelley Sentence

Vocabulary, a group vocabulary test consisting of the first

¹² Brooks, Fowler D. "Sectioning Junior High School Pupils by Tests and School Marks." Journal of Ed. Research. 13:333-33 Dec. 1922

list of words from the Stanford-Binet Test, two parts, 7 minutes to each part; and Woody-McCall Mixed Fundamentals in Arithmetic, Form A.

The elementary school marks for the fifth and sixth grades and the chronological ages were taken from the pupils' permanent record card. The marks were upon a five-fold basis, E. G. M. P. and D., a mark for each half year. They were given the following numerical values: E, 5; G, 4; M, 3; P, 2; D, 1. The ninety-three pupils were in two sections during the first half-year in junior high school. They were scattered throughout four sections during the second half-year, grouped upon the basis of previous school marks, and chronological age, in so far as administrative exigencies permitted.

To determine the scholastic success of the pupils Brooks combined (1) the average seventh grade marks in English, mathematics, history, and geography given to pupils in fairly homogeneous groups by teachers using the same standards in marking different sections; (2) the educational ages from the Stanford Achievement Tests. The average marks were weighted 2, and the educational ages 1, on the ground that there are important features of the first year course of study in these four subjects that are not included in the Stanford Achievement Tests.

For the purposes of the study, the pupils were

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The elementary school marks for the fifth and sixth grades and the chronological ages were taken from the pupils' permanent record card. The marks were upon a five-fold basis, A, B, C, D, and E, a mark for each half year. They were given the following numerical values: A, 5; B, 4; C, 3; D, 2; E, 1. The ninety-three pupils were in two sections during the first half-year in junior high school. They were scattered throughout four sections during the second half-year, grouped upon the basis of previous school marks and chronological age, in so far as administrative exigencies permitted.

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For the purposes of the study, the pupils were

divided into three sections upon the basis of the criterion of scholarship in the seventh grade, and this was used as the basis of correct sectioning. The pupils next divided into three sections upon each of the fourteen group tests, sixth-grade marks, and the average of fifth and sixth grade marks. The percentage of pupils who were correctly sectioned by each of these factors was used as a criterion of the validity of that factor for dividing pupils into ability groups.

Sixth grade marks were found by Brooks to be the most accurate single factor in sectioning pupils; 63.4 per cent having been sectioned correctly by them while only 2.2 per cent were displaced two sections. Stanford-Binet intelligence quotients placed 64.5 percent of the pupils in the proper sections but 5.4 per cent were displaced two sections. All other single factors showed a somewhat lower percentage of correct sectioning.

Achievement tests generally showed a lower percentage of accuracy than intelligence tests. The mean of group intelligence tests placed 55.3 per cent of the pupils accurately with 5.2 per cent displaced two sections; while the mean of the achievement tests placed 47.1 per cent accurately, with 12.0 per cent displaced two sections.

By combining the average of the sixth-grade marks with intelligence quotients from the Haggerty Delta 2 Intelligence Test, the highest percentage of correct sectioning, 73.1 per cent, was obtained while only 1.1 per cent were

divided into three sections upon the basis of the criterion of scholarship in the seventh grade, and this was used as the basis of correct sectioning. The pupils next divided into three sections upon each of the fourteen group tests, sixth-grade marks, and the average of fifth and sixth grade marks. The percentage of pupils who were correctly sectioned by each of these factors was used as a criterion of the validity of that factor for dividing pupils into ability groups.

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By combining the average of the sixth-grade marks with intelligence quotients from the Hagerity Unit 2 Intelligence Test, the highest percentage of correct sectioning, 75.1 per cent, was obtained while only 1.1 percent were

displaced two sections.

Brooks concludes from these results that relatively correct sectioning is secured if pupils entering the junior high school are divided upon the basis of sixth-grade marks, that less accurate sectioning is secured from the use of one or more group intelligence tests, but that more accurate sectioning than that given by either of the above bases is secured by combining sixth-grade marks with intelligence quotients from a group intelligence test as a basis of sectioning.

A somewhat similar experiment was conducted by
¹³
 Kefauver with 110 pupils entering junior high school in Fresno, California during the school year 1925-6. A number of factors were used for forming groups and each was evaluated by its relationship with the success of the pupils during the first semester of the junior high school. The different bases considered were: (1) average of school marks obtained in grades five and six; (2) teachers' estimate of capacity; (3) teachers' estimate of application; (4) Multi-mental test score; (5) intelligence quotients obtained from score on the Multi-mental test; (6) Thorndike-McCall Reading Test T score; (7) Woody-McCall Arithmetic Test score; and (8) Monroe Reasoning Arithmetic Test Score.

13. Kefauver, Grayson N. Validity of Bases for Forming Ability Groups.

Teachers College Record 31:99-144. Nov. 1929

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13. Kelsner, Grayson N. Validity of Bases for Forming Ability Groups. Teachers College Record 31:98-144. Nov. 1929.

The 110 pupils included in the investigation were taught in ability groups formed on a combination of the eight measures listed above with a weighting of 2 given to mental age and the average of school marks and one to each of the others.

The success of the pupils in the three subjects under consideration, English, mathematics, and social science, was determined by (1) objective tests and (2) a ranking of success by the teachers. The objective tests, nine in all, were constructed by the teachers under Kefauver's direction since the content of each course was modified for each group with the result that none of the standard achievement tests was found suitable for all sections. In ranking each pupil, a rating of 1 was given to the most successful pupils in each group and a ranking of 10 to the least successful. The ranking was based on a number of tests, many of which were objective, and on observation in the class room. For this reason the ranking by the teachers was given a weighting of 2, and the results of the objective tests a weighting of 1.

In determining the coefficient of correlation, between the various factors and the measure of success of the pupils in the different subjects, Kefauver first secured the mean of the correlations for each ability group. Because it is not customary to secure correlations for fractions of

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14

a group, the formula of Kelley¹⁴ was used for the purpose of converting the mean group correlations into correlations that would have been obtained if the variability of the measures had been equal to that for the entire class group.

A third correlation, r_3 , was obtained by taking the average of the original correlation and that obtained by the use of the standard deviation of the factors, that is, an average of the first correlation and the second. This correlation according to Kefauver, represents the most accurate relationship and was used as a basis for the comparison of the factors.

The single factor that showed the highest correlation with the measure of scholastic success was the teachers' estimate of capacity, which showed a correlation of .50 with the general scholastic success of the pupils, .49 with the pupils' success in English, .50 with pupils' success in mathematics, and .51 with pupils' success in social science.

Multi-mental intelligence quotients, mean of teachers' marks, Multi-mental Test scores, Thorndike-McCall Reading Test T score, and teachers' estimate of application ranked next in that order to the teachers' estimate of capacity, in degree of correlation with pupils' general success. Mean of teachers' marks gave a correlation of .42 with general success.

14. Kelley, Truman L. Statistical Method. The MacMillan Co. 1923. p. 221-223. Formula 178.

a group, the formula of Kelley was used for the purpose of converting the mean group correlations into correlations that would have been obtained if the variability of the measures had been equal to that for the entire class group. A third correlation, r_3 , was obtained by taking the average of the original correlation and that obtained by the use of the standard deviation of the factors, that is, an average of the first correlation and the second. This correlation according to Kelsner, represents the most accurate relationship and was used as a basis for the comparison of the factors.

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Multifactorial intelligence quotients, mean of teachers' marks, Multifactorial Test scores, Thorndike-McCall Reading Test T score, and teachers' estimate of application ranked next in that order to the teachers' estimate of capacity, in degree of correlation with pupils' general success. Mean of teachers' marks gave a correlation of .43 with general success.

The relationship of various combinations of factors with the measure of success in the different subjects was also determined by Kefauver. The combination of multi-mental intelligence quotient and teachers' estimate of capacity showed the highest correlation, .61, with pupils' general success, followed closely by the combination of teachers' estimate of capacity and Multi-mental test score which gave a correlation of .60 with general success. For English, the former combination gave the highest correlation, .64, while the latter gave the highest correlations with mathematics and social science, .61 and .62 respectively. The lowest correlation, .44, was found for the combination of Multi-mental test score and McCall Reading Test Score.

Kefauver concludes from his study that whatever combination of factors is used, it ought to include either the elementary school teachers' estimate of the pupils' capacity or the mean of the teachers' marks, (2) the pupils' intelligence quotient or score on a mental test, and (3) a general achievement test or a composite of the scores of a number of special achievement tests.

15

In September, 1924, Keener supervised the classi-

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15. Keener, E. E. Results of Homogeneous Classification of Junior High School Pupils. Journal of Educational Research 14:14-20. June, 1926.

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15

In September, 1934, Keener supervised the class-

15. Keener, E. E. Results of Homogeneous Classification of Junior High School Pupils. *Journal of Educational Research* 14:14-20, June, 1928.

fication of pupils into ability groups in the junior high schools of Chicago. About 5,000 pupils were classified into sections in grades VII and VIII according to scores on the Otis Classification Test. The achievement of the pupils was measured in January and again in May by means of the Stanford Achievement Test. The correlation between the scores on the Otis test and the achievement test scores was found to be 0.83 for the eighth grade in one school and according to the author practically the same correlation was found for the seventh grades in all schools.

16

Marzolf obtained the correlation between various measures of ability and the average of the seventh grade marks for 165 seventh grade pupils, most of whom previous to beginning junior high school had been enrolled in the same school system. The measures of ability were (1) the educational quotients determined by use of the Public School Publishing Co. Test, (2) the intelligence quotients obtained from the use of the Terman Group Test of Mental Ability, and (3) the yearly averages of the fifth and sixth grade marks of the pupils then enrolled in the seventh grade.

The average of the fifth and sixth grade marks gave a higher correlation, .768 with seventh grade marks,

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16. Marzolf, Stanley S. The Classification of High School Students. School and Society 32:881-82. December, 1930.

classification of pupils into ability groups in the junior high schools of Chicago. About 5,000 pupils were classified into sections in grades VII and VIII according to scores on the Otis Classification Test. The achievement of the pupils was measured in January and again in May by means of the Stanford Achievement Test. The correlation between the scores on the Otis test and the achievement test scores was found to be 0.83 for the eighth grade in one school and according to the author practically the same correlation was found for the seventh grades in all schools.

18

Marzoff obtained the correlation between various

measures of ability and the average of the seventh grade marks for 183 seventh grade pupils, most of whom previous to beginning junior high school had been enrolled in the same school system. The measures of ability were (1) the educational quotients determined by use of the Public School Publishing Co. Test, (2) the intelligence quotients obtained from the use of the Terman Group Test of Mental Ability, and (3) the yearly averages of the fifth and sixth grade marks of the pupils then enrolled in the seventh grade. The average of the fifth and sixth grade marks gave a higher correlation, .788 with seventh grade marks,

than any other single factor. Educational quotients gave a correlation of .658. The combination of sixth grade marks and intelligence quotients gave the highest correlation of all, .83. Sixth grade marks and educational quotients gave a correlation of .793. Averages of fifth and sixth grade marks and intelligence quotients a correlation of .81, average of fifth and sixth grade marks and educational quotients a correlation of .795, and the combination of educational quotients and intelligence quotients a correlation of .72 with seventh grade marks.

A comparison of the results of these studies must of course take into consideration the fact that the criterion of pupils success was different in each case. The seventh grade marks of the teachers, however, were an important factor in determining the criterion of success in each of the three studies.

In Brooks' study they were given a weighting of 2 against 1 for achievement test scores in determining the measure of success, while in Marzolf's experiment they constituted the sole criterion of success in the seventh grade. It is significant that the results in both cases showed the greatest reliability to be found in the combination of sixth grade marks and intelligence quotients from a group intelligence test.

In Kefauver's study, the criterion of success

than any other single factor. Educational quotients gave a correlation of .65. The combination of sixth grade marks and intelligence quotients gave the highest correlation of all, .83. Sixth grade marks and educational quotients gave a correlation of .79. Averages of fifth and sixth grade marks and intelligence quotients a correlation of .81, average of fifth and sixth grade marks and educational quotients a correlation of .78, and the combination of educational quotients and intelligence quotients a correlation of .73 with seventh grade marks. A comparison of the results of these studies must of course take into consideration the fact that the criterion of pupils' success was different in each case. The seventh grade marks of the teachers, however, were an important factor in determining the criterion of success in each of the three studies.

In Brooks' study they were given a weighting of 2 as against 1 for achievement test scores in determining the measure of success, while in Karsoll's experiment they constituted the sole criterion of success in the seventh grade. It is significant that the results in both cases showed the greatest reliability to be found in the combination of sixth grade marks and intelligence quotients from a group intelligence test.

In Karsoll's study, the criterion of success

TABLE XXII COMPARISON OF RANKING OF VARIOUS BASES IN
CORRECTLY CLASSIFYING PUPILS ACCORDING TO
ABILITY IN THE STUDIES OF (1) BROOKS,
(2) KEFAUVER, AND (3) MARZOLF.

Bases	(1) Brooks ^a	(2) Kefauver ^b	(3) Marzolf ^c
Intelligence Quotients (Otis Group Test)	4 ^d		
Intelligence Quotients (Stanford-Binet)	2		
Intelligence Quotients (Multi-mental test)	1	2 ^e	
Teachers' estimate of application		1	
Averages of fifth-sixth grade marks		3	1
Sixth grade marks	1		
Mean of achievement tests	14		
Educational quotients			2
Thorndike-McCall Reading Test Scores	13	5	
Intelligence Quotients (Terman Group Test)	3		3 ^f

a. Criterion of correct classification, percentage of pupils' displaced from a three-fold grouping on the basis of seventh grade marks and achievement test.

b. Criterion of correct classification, the correlation of bases with achievement tests scores and a ranking of pupils by teachers in a three-fold grouping.

c. Criterion of correct classification, correlation of bases with seventh grade marks.

d. 19 single bases used in this study.

e. 9 single bases used in this study.

f. Only 1 single bases used in this study.

consisted of a ranking by the teachers,--determined largely by school tests--which were given a weighting of 2 as against

TABLE XXII
COMPARISON OF RANKING OF PUPILS ACCORDING TO
CORRECTLY CLASSIFYING PUPILS ACCORDING TO
ABILITY IN THE STUDY OF (1) BROOKS,
(2) KEISER, AND (3) MARSHALL.

Base	(1) Brooks	(2) Keiser	(3) Marshall
Intelligence Quotients (Otis Group Test)	4		
Intelligence Quotients (Stanford-Binet)	3		
Intelligence Quotients (Multi-mental test)	4	3	
Teachers' estimate of application		1	
Average of fifth-sixth grade marks		3	1
Sixth grade marks	1		
Mean of achievement tests	14		
Educational quotients			3
Thorndike-McCall Reading Test Scores	13	3	
Intelligence Quotients (Terman Group Test)	3		3

a. Criterion of correct classification, percentage of pupils
displaced from a three-fold grouping on the basis of seventh
grade marks and achievement test.
b. Criterion of correct classification, the correlation of passes
with achievement test scores and a ranking of pupils by teach-
ers in a three-fold grouping.
c. Criterion of correct classification, correlation of passes
with seventh grade marks.
d. 18 single passes used in this study.
e. 9 single passes used in this study.
f. Only 6 single passes used in this study.

consisted of a ranking by the teachers,--determined largely
by school tests--which were given a weighting of 3 as against

1 for the scores of certain achievement tests. It is probable that the criterion of success in this case was not greatly different from either of the other two.

TABLE XXIII COMPARISON OF RANKING OF VARIOUS COMBINATIONS OF BASES IN CORRECTLY CLASSIFYING PUPILS ACCORDING TO ABILITY IN THE STUDIES OF (1) BROOKS (2) KEFAUVER AND (3) MARZOLF

COMBINATION OF BASES	(1) Brooks ^a	(2) Kefauver ^b	(3) Marzolf ^c
Teachers' estimate of capacity and intelligence quotients		1 ^e	
Averages of fifth-sixth grade marks and intelligence quotients		5	2 ^f
Sixth grade marks and intelligence quotients	1 ^d		1
Averages of fifth-sixth grade marks and educational quotients			3
Average of fifth-sixth grade marks and Thorndike-McCall Reading Test Scores		5	
Intelligence quotients and Educational quotients			5
Intelligence quotients and Thorndike-McCall Reading Test Scores		6	

a. Criterion of correct classification percentage of pupils displaced from a three-fold sectioning on basis of achievement test scores and seventh grade marks.

b. Criterion of correct classification, correlation of combination of bases with achievement test scores and ranking by teachers in a three-fold grouping.

c. Criterion of correct classification, correlation of combination of bases with seventh grade marks.

d. Only 1 combination used in this study. This combination outranked all other bases taken singly or in combination.

e. Ten combinations of bases used in this study.

f. Five combinations of bases used in this study.

I for the scores of certain achievement tests. It is probable that the criterion of success in this case was not greatly different from either of the other two.

TABLE XXIII
COMPARISON OF RANKING OF VARIOUS COMBINATIONS
OF BASES IN CORRECTLY CLASSIFYING PUPILS ACCORDING TO ABILITY IN THE STUDIES OF
(1) BROOKS (2) KEISER AND (3) MARSHALL

COMBINATION OF BASES	(1) Brooks	(2) Keiser	(3) Marshall
Teachers' estimate of capacity and intelligence quotients		1	
Averages of fifth-sixth grade marks and intelligence quotients		2	2
Sixth grade marks and intelligence quotients	1		
Averages of fifth-sixth grade marks and educational quotients			3
Average of fifth-sixth grade marks and Thorndike-McCall Reading Test Scores		2	
Intelligence quotients and educational quotients			2
Intelligence quotients and Thorndike-McCall Reading Test Scores		2	

a. Criterion of correct classification percentage of pupils placed from a three-fold sectioning on basis of achievement test scores and seventh grade marks.
b. Criterion of correct classification, correlation of combination of bases with achievement test scores and ranking by teachers in a three-fold grouping.
c. Criterion of correct classification, correlation of combination of bases with seventh grade marks.
d. Only 1 combination used in this study. This combination out-ranked all other bases taken singly or in combination.
e. Ten combinations of bases used in this study.
f. Five combinations of bases used in this study.

Kefauver found that the highest correlation existed between a combination of elementary school teachers' estimate of capacity and intelligence quotients and the measure of success named above. Of the combinations which did not include the teachers' estimate of capacity, the highest correlation was found for the mean of teachers' marks and Multi-mental intelligence quotients.

17

In 1922, Breed and Breslich conducted an experiment in grouping pupils according to ability in the seventh and ninth grades of the junior high school of the University of Chicago. The tests selected for use in the investigation were the Chicago Group Intelligence Test, Form A, and the Terman Group Test of Mental Ability, Form A. These tests were administered to a group of 54 seventh grade pupils and a group of 60 ninth grade pupils. In order to determine,-- among other things,--the extent to which the tests agreed in the measure of intelligence, the authors obtained the coefficients of correlation between the tests.

The Chicago-Terman tests showed an intertest correlation of .69 in the seventh grade and .77 in the ninth grade. The Chicago-Otis tests showed a correlation of .77 in the seventh grade and .78 in the ninth grade. The Otis-Terman tests showed correlations of .74 and .85 in the seventh and ninth grades respectively.

¹⁷Breed, F. S. and Breslich, E. R. "Intelligence Tests and the Classification of Pupils" School Review 30:51-66. 200-226 Jan. 1922, March 1922.

Katzenberger found that the highest correlation existed between

a combination of elementary school teachers' estimate of

capacity and intelligence quotients and the measure of suc-

cess named above. Of the combinations which did not in-

clude the teachers' estimate of capacity, the highest cor-

relation was found for the mean of teachers' marks and Mat-

ti-mental intelligence quotients.

IV

In 1923, Freed and Ereschick conducted an exper-

iment in grouping pupils according to ability in the seventh

and ninth grades of the Junior High School of the University

of Chicago. The tests selected for use in the investigation

were the Chicago Group Intelligence Test, Form A, and the Ter-

man Group Test of Mental Ability, Form A. These tests were

administered to a group of 64 seventh grade pupils and a

group of 60 ninth grade pupils. In order to determine,--

among other things,--the extent to which the tests agreed in

the measure of intelligence, the authors obtained the coeffi-

cients of correlation between the tests.

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The Chicago-Otis tests showed a correlation of .77 in the sev-

enth grade and .78 in the ninth grade. The Otis-Terman tests

showed correlations of .74 and .85 in the seventh and ninth

grades respectively.

A series of composite intelligence scores was derived from the three intelligence tests to obtain a series which might represent more nearly the true value than any single series of scores.

A study of the disparity between individual scores for the same pupils in two different tests was made. It was found to be six points when measured on the Chicago scale, 11.1 points when measured on the Otis Scale and 13.9 when measured on the Terman Scale. This degree of variability led the investigators to conclude that caution should be exercised in the use of group intelligence tests for purposes of classifying pupils; that at least two good group tests should be employed and the composite score used; and that additional testing may be necessary where test scores show marked disagreement.

A somewhat similar conclusion was reached by Glass in 1920. In February of that year, the Otis Group Intelligence Tests were administered to pupils entering the Washington Junior High School of Rochester, New York. In the middle of the term the Chicago Group Intelligence Tests were given to the same pupils for the purpose of checking the results of one group test with another. For the sake of comparing the relative classification of individuals among the eight classes, the whole group was divided into quartiles. Two-thirds of

¹⁸Glass, James M. "Classification of Pupils in Ability Groups" School Review 28:495-508 Sept. 1920

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the membership of each quartile as determined by the Otis Tests remained constant in the Chicago tests, while one-third was distributed among the other quartiles.

Glass concluded from this result that group intelligence tests furnish only a rough measure of intelligence and that only composite results are reliable.

From these two studies and from the experience of others with a broad background in the administration and interpretation of mental tests, the conclusion suggested is that if group mental tests are used in sectioning pupils at least three good tests should be employed.

The various studies examined above furnish strong evidence, therefore, that the bases of sectioning pupils upon entrance to the junior high school should include (1) either the elementary school teachers' estimate of capacity or the elementary school teachers' marks, or the sixth grade marks, and (2) the intelligence quotients from an individual examination or from a composite score from three or more group intelligence tests, or the composite scores from three or more group intelligence tests.

✓ 2. Mode of Procedure in Ability Grouping

In the preceding chapters, the writer arrived at certain conclusions with regard to the bases most suitable for classifying pupils according to ability. Many authorities feel, however, that other factors besides ability must be

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tain conclusions with regard to the bases most suitable for classifying pupils according to ability. Many authorities feel, however, that other factors besides ability must be

taken into consideration if the pupils are to be placed in the groups most suited to their needs and capacities. Physiological development, general health, social maturity, and chronological age are some of these factors. This is particularly true in junior high schools where the number of pupils in each intelligence group is so large that pupils in widely divergent stages of physical and social development may be found in each group.

19

Freeman, for example, speaks of horizontal and vertical grouping. The vertical grouping would be purely on the basis of academic ability as determined by tests, school marks, and teachers' judgments. Horizontal grouping would be on the basis of the stage which the pupil has reached of physiological and social development. According to the author:

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"There is satisfactory evidence that children go through certain developmental stages and that these stages determine to a large extent the groups into which they should be placed."

These two methods of grouping are intended to be complementary. The pupils may be grouped according to one basis, e.g. horizontally, and then if the number of pupils is sufficiently large grouping within each division on the other basis may be carried out.

A plan which takes cognizance of all these factors is that advocated by Ryan and Crecilius. According to this

21

¹⁹Freeman, Frank N. "Bases on which Students Can Be Classified Effectively" School Review 29:734-45 Dec. 1921

²⁰Freeman, Frank N. Op. cit. p. 739

²¹Ryan, Heber H. and Crecilius, P. Ability Grouping in the Junior High School

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²⁰Freeman, Frank W. Op. cit. p. 733
²¹Ryan, Heber W. and Greeff, F. Ability Grouping in the Junior High School

plan, grouping of pupils in the junior high school is based on several criteria, namely; mental age and intelligence quotients, chronological age, anatomical age, social maturity, pedagogical age, school success, and physical tone.

In forming groups, the following procedure is observed: A chart is made for each pupil. Upon this chart is placed, first, the intelligence quotient, and the name of the test from which it was determined. The chronological age given in years and months at the date on which the mental test is next placed on the chart in the space indicated. The dentition age is next determined from a chart provided for the purpose. The heights and weights are then taken and are expressed in terms of age by consulting a table of age norms for height and weight such as those published by Baldwin and Wood,²² and Clark, Sydenstrucker, and Wood.²³

The social age of the pupil is then entered. This is a subjective estimate furnished by the teachers of the elementary school and should be the result of a consensus of the opinions of the teachers who have come into contact with the pupil rather than the opinion of one teacher. The ratings in Arithmetic fundamentals, reading rate, and reading comprehension are determined by the use of standard tests such as the Woody-McCall Test in Mixed Fundamentals and the

²²Baldwin, Bird T. and Wood, Thomas. A Class-room Weight Record. Published by U. S. Health Service.

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Monroe Test for Silent Reading. These are entered on the chart in age-norms as well as according to score made. School success, as determined by rank in class is next entered. This is expressed as a fraction, the numerator expressing the pupils' rank and the denominator the number of pupils in the class, since the rank in class has little significance unless the number of pupils in the class is given.

Finally, the general health of the pupil as reported by the school physician who may report the pupil's health as E.(Excellent), G. (Good), F. (Fair), and P. (Poor). The name of the school is also entered on the card.

When all these ratings have been determined, translated into age-norms and entered upon the chart, a graph is drawn which represents the profile of the individual whose ratings are noted thereon.

In organizing pupils into groups the following procedure is used: First, the number of charts is arranged according to intelligence quotients from the highest to the lowest. From the number which represents the total number of pupils in the grade for which grouping is taking place, and which usually is the seventh, the number of groups to be formed is decided upon. For example, in an incoming class of 250 pupils perhaps 8 or 9 groups will be formed. With this in mind, all of the charts of I.Q. above 115 are taken and separated from the others. From this number are removed all those which

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pils in the grade for which grouping is taking place, and

which usually is the seventh, the number of groups to be formed

is decided upon. For example, in an incoming class of 350 pu-

pils grades 8 or 9 groups will be formed. With this in mind,

all of the charts of I. Q. above 115 are taken and separated.

From this number are removed all those which

show a dangerously low mark in any item listed on the chart. The reason for this is that experience has shown that any pupil who is below the level of the group in any particular will have difficulty keeping up with the work of the group. For example, a pupil of high I. Q., but of low achievement in school work will have difficulty in doing the work of the group. Likewise a pupil of low physical tone will perhaps lack the physical strength to progress with the accelerated group.

When all these exceptions have been removed, the remaining group constitutes the "A" Group. The remaining pupils of high I. Q. will constitute the "B" group.

The next group formed will be the lowest group or "C" group. Here the lowest I. Q's are selected and from this lowest number are chosen those of low achievement who are older chronologically and are in early or later adolescence. These pupils are segregated according to sex in groups somewhat smaller than the other groups and they are classified as the segregated "C" groups to distinguish them from the mixed "C" groups.

The mixed "C" groups are those whose I. Q's are below average or close to the border line, but who are otherwise of normal development and of average age and achievement. These pupils are not segregated as the factors which argue for such a practice in the other "C" groups are

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which argue for such a practice in the other "C" groups are

not present here.

The remaining pupils are organized into "B" groups. The "B" groups are of two kinds, first; those of average or somewhat above average I. Q. but below the level of the "A" group, and second; those of high I. Q., who have been excluded from the "A" group. The former are normal in all respects though not of as high rating as the "A" group while the latter are a group of high mental level who are backward in some respect. Either they are less mature than the other pupils or they have neglected their previous school work or are below average in some respect. This group is called the "top B" group. Quite often they are as capable as the "A" group, and in many cases pupils should be transferred to that group after they have demonstrated capacity to do the accelerated work.

Thus there are five types; the A's, top B, Average B's, Mixed C's, and Separated C's. None of these groups, however, should be considered as fixed and unchanging, but promotions should be made from one group to the other as the pupils work shows his capacity to work with a stronger group. Likewise, if a pupil's work should indicate that his qualifications have been overestimated or that he is unwilling to do the work of the higher group he should be transferred without delay. Flexibility should be the guiding principle of group organization.

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Thus there are five types; the A's, top B, average

B's, Mixed C's, and Rejected C's. None of these groups,

however, should be considered as fixed and unchanging, but

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ing principle of group organization.

c. ATTITUDES TOWARD ABILITY GROUPING

Among the disadvantages which those opposed to ability grouping claim are attached to its use, the following have been listed by Turney:

- "1. A stigma is attached to low sections operating to discourage the pupils in those sections.
2. Teachers are unable or do not have time to differentiate the work for different ability levels.
3. Teachers object to the slower groups.
4. Parents complain when their children are placed in slower groups.
5. Program construction is rendered more difficult.
6. Frequent transfers necessitate more efficient office help."

The above list does not of course include all the disadvantages supposed to arise from the use of homogeneous grouping. It does, however, contain some of the strongest objections to the use of this plan. It is undemocratic, say its opponents; it stigmatizes dull pupils; it renders program construction more difficult; and it creates dissatisfaction among the members of the teaching staff especially among those who must teach the slow groups.

Because of the subjective nature of the effects which are according to the opponents of ability grouping, thus created, it is difficult to establish the validity or non-validity of the charges.

24. Turney, Austin H. Op. Cit. p. 23.

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A study by Clem and Wroath, attempted to throw light on these points. In an effort to determine, among other things, the subjective reactions of junior high school administrators to homogeneous grouping, a questionnaire was sent the principals of eighty junior high schools in cities of 100,000 population or over in the United States. The questions concerned with these subjective attitudes dealt with the following items; attitudes of pupils; quality of work, cooperation of pupils; development of citizenship of pupils; cooperation of teachers; efficiency of teachers; attitude of parents toward the ability grouping system; and a few others.

Tabulation of the replies of 71 principals showed that 55 reported better attitudes among pupils and 1 reported undesirable attitudes; 55 reported a better quality of work; 51 reported a greater cooperation of pupils and none reported less cooperation; 33 reported greater development of citizenship qualities of pupils; 40 reported cooperation of teachers, and none reported lack of teacher cooperation; 40 reported greater efficiency of teachers, while 5 reported lack of teacher adjustment; 37 reported

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25. Clem, Orlie M. and Wroath, Lydia F. Practices in Homogeneous Grouping in Junior High Schools. Educational Method 2:6-11. Jan. '34.

general satisfaction of parents with the ability grouping system, while one reported dissatisfaction of parents.

The results of this tabulation do not, of course, furnish conclusive evidence with regard to the truth of the objections enumerated above. The subjective reactions of school principals, for example, cannot be accepted as deciding whether the quality of the pupils' work has increased or decreased. They should however furnish a valuable means of estimating the extent of cooperation, efficiency, and adjustment to groups of teachers of homogeneous groups who are under the supervision of these principals.

Many educators feel that a greater degree of skill, and a greater ability to adapt materials and methods is required to teach slow groups than bright groups. It seems equally obvious that adaptation of materials and teaching procedures may more easily be accomplished in
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groups whose range of ability is narrow. Billet states:

"Part of the unanalyzed art of teaching has consisted always in the teachers' capacity to sense the needs of the learner and to provide for them. Hence when good teachers receive a homogeneous group they are quick to recognize that certain teaching techniques are in order."

26. Billet, Roy O. Op. cit. p. 142

general satisfaction of parents with the ability grouping system, while one reported dissatisfaction of parents. The results of this tabulation do not, of course, furnish conclusive evidence with regard to the truth of the opinions enumerated above. The subjective reactions of school principals, for example, cannot be accepted as deciding whether the quality of the pupils' work has increased or decreased. They should however furnish a valuable means of estimating the extent of cooperation, efficiency, and adjustment to groups of teachers of homogeneous groups who are under the supervision of these principals.

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Part of the unanalyzed art of teaching has consisted always in the teacher's capacity to sense the needs of the learner and to provide for them. Hence when good teachers receive a homogeneous group they are quick to recognize that certain teaching techniques are in order.

Undoubtedly, many teachers would prefer to teach bright groups. Many teachers, also, are not as capable of teaching slow groups as others. In the replies made to Clem and Wroath, 40 schools report the cooperation of teachers and none report lack of cooperation; 40 schools report greater efficiency of teachers and 5 report lack of adjustment. Evidence is not lacking, therefore, to show that the majority of teachers are able and willing to make whatever adjustments are necessary for teaching classes of varying ability.

The fact that parents were reported generally satisfied with the ability grouping system by 37 schools while only 1 school reports dissatisfaction is some evidence, though not conclusive, of a favorable attitude toward the use of this plan.

One of the strongest objections that have been made against homogeneous grouping is that a stigma is attached to low sections operating to discourage the pupils in these sections. It is a matter of debate, however, whether the pupil who is failing in a heterogeneous group is not equally or even to a greater degree subject to discouragement and the ridicule of pupils of superior ability.

²⁷
Billet, in one of his studies, reported subjective

27. Billet, Roy O. Differentiation of Freshman English for Groups of Different Attitudes. Educational Research Bulletin of Ohio State University. 5:185-190. April 1926. Summarized by Turney, A.H. Op. Cit. p. 28.

Undoubtedly, many teachers would prefer to teach bright groups. Many teachers, also, are not as capable of teaching slow groups as others. In the replies made to Glen and Wright, 40 schools report the cooperation of teachers and none report lack of cooperation; 40 schools report greater efficiency of teachers and 3 report lack of adjustment. Evidence is not lacking, therefore, to show that the majority of teachers are able and willing to make whatever adjustments are necessary for teaching classes of varying ability.

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observations to the effect that heterogeneous classes showed some undesirable situations. Bright pupils laughed at dull ones. Dull pupils seldom participated, and when doing so showed lack of assurance.

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An investigation was conducted by Turney and Hyde in an attempt to find out from junior high school pupils their attitudes toward ability grouping as it was practiced in the school they attended in Lawrence, Kansas. The study involved 645 pupils in grades VII-A, VIII-A, VIII-B, IX-A, and IX-B in the junior high school, who were divided into three or four sections for each grade on the basis of intelligence quotients from the Stanford-Binet individual examinations supplemented by elementary school marks, by the judgment of the elementary school teachers, and by one or more achievement tests.

To these 645 pupils, the following questions were submitted:

- "1. Have your parents ever urged you to try to be placed in another group?
2. Has your teacher ever urged you to work harder in order that you could be placed in a higher group?
3. Has your teacher ever urged you to do better work because you are not doing as well as you could?
4. Has your teacher ever suggested that you were working too hard?

28. Turney, Austin H. and Hyde, M. F. The Attitude of Junior High School Pupils Toward Ability Grouping. School Review 39:597-607. Oct. '31.

5. Has any one ever suggested that you were working too hard?
6. Have your parents ever scolded or blamed you because you were not in as high a group as they would like to have you?
7. Have any other pupils ever said anything to you that make you feel that you would like to be in another group?
8. What comments have been made?
9. Would you be happier if the pupils in your school were not placed in sections?
10. What are your reasons for answering question nine as you did?
11. Do you think that you get along better in your work because you are in the group that you are in?
12. Have you ever been "razzed" or "kidded" because you were in a high or low section?"

To question 1, 26 per cent of the pupils answered "yes", 72 per cent "no", and 2 percent gave no answer; to question 2, 28 per cent of the pupils answered "yes", 20 per cent "no", and 2 per cent gave no answer; to question 6, 21 per cent answered "yes", 77 per cent "no", and 2 per cent gave no answer at all. To question 7, "Have any other pupils ever said anything to you that make you feel that you would like to be in another group?", a question that would probably have a great effect on the attitude of the pupil, 17 per cent answered "yes", 82 per cent answered "no", and 1 per cent gave no answer. Question 9, "Would you be happier if the pupils in your school were not placed in sections?", the answers to which are more truly indicative of the pupils' reaction than any other, was answered in the affirmative by 31 per cent of the pupils and in the negative by 62 per cent. Question 11, which attempted to secure the

6. Has any one ever suggested that you were working too hard?
7. Have your parents ever scolded or blamed you because you were not in as high a group as they would like to have you?
8. Have any other pupils ever said anything to you that made you feel that you would like to be in another group?
9. What comments have been made?
10. Would you be happier if the pupils in your school were not placed in sections?
11. What are your reasons for answering question nine as you did?
12. Do you think that you get along better in your work because you are in the group that you are in?
13. Have you ever been "kicked" or "kidded" because you were in a high or low section?

To question 1, 38 per cent of the pupils answered "yes", 73 per cent "no", and 3 per cent gave no answer; to question 2, 34 per cent of the pupils answered "yes", 30 per cent "no", and 3 per cent gave no answer; to question 3, 31 per cent answered "yes", 77 per cent "no", and 3 per cent gave no answer at all. To question 4, "Have any other pupils ever said anything to you that made you feel that you would like to be in another group?", a question that would probably have a great effect on the attitude of the pupils, 19 per cent answered "yes", 63 per cent answered "no", and 1 per cent gave no answer. Question 5, "Would you be happier if the pupils in your school were not placed in sections?", the answers to which are more truly indicative of the pupils' reaction than any other, was answered in the affirmative by 31 per cent of the pupils and in the negative by 64 per cent. Question 11, which attempted to secure the

pupils opinion of the effect of grouping upon his achievement, was answered affirmatively by 24.5 per cent of the pupils, negatively by 68 per cent of the pupils while 7.5 per cent did not answer. Thirteen per cent of the pupils answered "yes" to question 12, 83 per cent answered "no", and 4 per cent gave no answer

The writers sum up the attitudes of the pupils
29
as follows:

"It is evident that the situation is not perfect in the sense that all the pupils are entirely happy; that none of them would prefer a different arrangement, or that none of them have ever been subject to unpleasant comment or criticism; However, it is plain that the great majority are happy and satisfied, that they look on school as a serious business from which they want to get as much as possible, and that they accept and believe in the grouping that exists as the best situation for them."

Clem and Wroath found that 60 principals or approximately 85 per cent of those in charge of junior high school employing this plan felt that homogeneous grouping did not brand or stigmatize the pupils in their schools while 6 or about $8\frac{1}{2}$ per cent felt that it did. Sixty-four or 91 per cent thought that the use of grouping did not tend to make bright children become egotistical while one principal thought that it did. Eighty-five per cent felt that dull pupils were satisfied with their groups, while $8\frac{1}{2}$ per cent thought that they were not satisfied.

From these studies, therefore, we must conclude that the objection that grouping pupils according to ability tends to "stigmatize" or discourage dull pupils is of doubtful validity.

d. PRACTICES IN CONNECTION WITH ABILITY GROUPING IN THE JUNIOR HIGH SCHOOL.

While ability grouping is practiced by a majority of junior high schools, a great diversity of procedure in forming and in teaching such ability groups is found to exist.

In an effort to learn to what extent individual differences were being recognized the junior high school,³⁰ Dvorak, about 1921, addressed inquiries to 86 junior high schools in various parts of the United States. One of the questions asked was, "On what bases are grades divided into different sections?", and in order to secure specific replies to this question, the schools were asked which of the following criteria were used in dividing: (1) mental tests, (2) teachers' judgment, (3) standardized achievement tests in subject matter, (4) random selection, (5) sex, (6) school marks earned in previous grade, (7) school marks earned in present grade, (8) chronological age.

30. Dvorak, August. Op. Cit. p. 679.

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Analysis of the replies showed that 11 of the schools relied upon random selection; 7 relied on mental tests and teachers' judgments; 5 relied on teachers' judgments alone; 6 relied on mental tests, teachers' judgments, and subject tests; 5 relied on teachers' judgments and previous marks; and the other schools relied on various combinations of the bases in question.

Further analysis shows that 41 schools used no mental tests and 45 used mental tests; 59 schools used no educational tests and 27 used educational tests; 33 schools used no tests and 53 used tests, 32 schools relied on 1 test, and 21 used more than 1 test; 21 schools used only 1 mental test, and 24 schools used more than 1 mental test; 4 schools use but 1 educational test and 23 schools used more than 1 educational test; 1 school relied on mental tests alone; 2 schools relied on mental and educational tests alone; 21 schools used both mental and educational tests, often combined with other bases; 9 schools used mental tests and 1 other criterion; 4 schools used educational tests and 1 other criterion.

31

In 1933, Clem and Wroath in a similar study, sent a questionnaire to 80 junior high schools in cities of over 100,000 population throughout the United States. From the

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31. Gies, Orville M. and Wright, Lydia E. Op. cit. p. 307

replies, 61 were found to have a definite system of homogeneous grouping, 10 had a modified form of homogeneous grouping, and 9 had no homogeneous grouping.

Forty-two different bases were used by these schools in forming groups. Fifty-three of the schools used intelligence quotients; 47 schools used mental tests; 40 schools used teachers' records in present class; 33 used chronological age; 34 used achievement tests; 29 used school marks in previous grades; 25 used teachers' judgment of intelligence; 20 used class rank in the previous grade, 11 used personal judgment of personal traits; 12 used educational age; 10 used social age, and 10 used standard achievement tests. All other bases were used by less than 10 schools.

A comparison of the later findings with those of Dvorak show a much greater use of mental tests or intelligence quotients. This undoubtedly represents improvement as intelligence quotients have been shown to be highly valuable as a basis for forming ability groups. The other bases that are most widely used,--achievement tests, school marks in previous grades, teachers' judgment of intelligence, etc.--have also been found to be reliable for purposes of sectioning pupils according to ability.

Another aspect of homogeneous grouping which deserves consideration is the manner and extent of adapting subject matter and instruction to the abilities of the

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various groups. Turney states:

"It may not be too much to say, therefore, that the experimental literature contains strong indications that when ability grouping is accompanied by suitable adaptations of method or materials better achievement may result or time may be saved."

33

Dvorak found that 49 of the 86 schools listed "quality of work" as the differentiating factor among the ability groups; 23 maintained different promotional rates; 27 schools varied the number of pages covered, according to the ability of the group; 26 schools reported differences in the number of subjects taken up; and 38 schools reported extra work in the superior sections.

34

Clem and Wroath, likewise, made inquiries as to methods of adapting instruction to groups of different ability in the junior high school. From the replies of 71 junior high schools, it was found that 22 schools provided acceleration for brighter pupils; 45 maintained standards of work commensurate with the abilities of each group; 24 maintained special standards of marks for each group bases on relative achievement in that group irrespective of other groups; 40 provided a course of minimum essentials covered; 33 provided special citizenship training; 28 provided drill work; 24 provided individual instruction; 40 provided opportunities for creative self-expression; 15 provided opportunities for the slow pupil to do the work expected of the

³²Turney, Austin H. Op. cit. p. 41

³³Dvorak, August Op. cit. p. 684

³⁴Clem, Orlie M. and Wroath, Lydia F. Op. cit. p. 209

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32 Turney, Austin H. Op. cit. p. 41

33 Dwornik, August Op. cit. p. 634

34 Olsen, Otis M. and Wroath, Lydia F. Op. cit. p. 208

highest group; 19 provided a regular course with allowances made for slow groups; 18 provided opportunity for study coach classes; and a small number of schools used various other methods.

It is interesting to note that approximately the same number of schools, about one-third of the group in each study report the use of different rates of promotion. Although the opinion of educational leaders is that greater benefits may be secured by enriching the program of studies and intensifying the training of pupils throughout the usual number of scholastic years, it is evident that the notion of accelerating bright pupils through the grades by rapid or double promotions persists.

Reference to the frequency with which the various procedures listed above are being used, shows that the majority of schools are attempting to adopt subject matter and methods to the capacity of the group. Enrichment, with supplementary work for bright pupils--a procedure that is generally recognized as educationally sound--is used by 61 or more than 80 per cent of the schools reporting to Clem and Wroath. It is obvious, however, that some of these schools provide acceleration for the bright pupils as well. Intensive work for bright pupils is provided by 48 schools; standards of work commensurate with the ability of the

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group are maintained by 45 schools; and courses of minimum essentials for the dull are provided by 40 schools. The large number of schools making such provisions shows that efforts are being made by an increasing number of schools to furnish each group with the kind of instruction best suited to its needs and abilities. The increasing heterogeneity of the school population clearly indicates that the same course of study cannot be offered to all groups regardless of the time spent on the subject. Efforts to adjust courses to individual differences in ability by different promotional rates, by increasing or decreasing the number of subjects, or by enlarging or reducing the number of pages covered seems not only unsound but futile. The teaching procedure and the subject matter itself must be adapted to the capacity of the group if the advantages claimed for homogeneous grouping are to be realized.

That the majority of junior high schools today are cognizant of this and are, in fact, adjusting materials and methods to the needs and abilities of the group is apparent from the later study. A comparison of the methods of adapting instruction for the various groups revealed in these two studies shows that the trend is toward enrichment and adjustment in place of attempts to fit the individual's ability to each course.

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CHAPTER V

SUMMARY AND CONCLUSION

In this study the purpose has been to examine the individual differences of junior high school pupils in the light of the peculiar functions of the junior high school, to draw whatever conclusions about the nature, extent, and tendencies of these individual differences seemed to be justified by the available data, and to examine particularly the technique of ability grouping to determine from theoretical and practical studies of the subject what practices have been found most valuable and most effective in connection with the use of this plan as a means of recognizing individual differences in this unit of the school system.

Certain of these individual differences were examined directly by the writer, but for the most part the study has consisted of an analysis and comparison of the more recent investigations of individual differences in the junior high school. In examining the technique of ability grouping, the procedure has been to study and compare the more important of the recent experiments and reports dealing with this plan of providing for individual differences in the junior high school.

CHAPTER V

SUMMARY AND CONCLUSION

In this study the purpose has been to examine the individual differences of junior high school pupils in the light of the peculiar functions of the junior high school, to draw whatever conclusions about the nature, extent, and adaptability of these individual differences seemed to be justified by the available data, and to examine particularly the technique of ability grouping to determine from theoretical and practical studies of the subject what practices have been found most valuable and most effective in connection with the use of this plan as a means of recognizing individual differences in this unit of the school system.

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The junior high school, while having certain functions in common with the other units of the public school system, was found to have certain functions especially adapted to itself because the features of this organization were adopted for the express purpose of performing these functions. The peculiar functions of retention of pupils, recognition of individual differences, exploration and guidance, economy of time, beginnings of vocational education, recognition of the nature of the child at adolescence, departmental teaching, and improving the disciplinary situation and socializing opportunities were found to be of primary importance among these functions, exploration and guidance and recognition of individual differences were found to be most important.

An examination of the individual differences of junior high school pupils disclosed wide variation in the ages of pupils amounting in some cases to five or six years. There was some evidence, though slight, that the amount of overageness in the later grades in the later years of the junior high school has decreased. Such differences in age were shown to be accompanied by corresponding differences in physical size and development, and in degree of sexual maturity.

The intelligence of pupils in these grades was shown to vary greatly extending, according to Terman's

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The intelligence of pupils in these grades was shown to vary greatly extending, according to Terman's

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classification, from the point on the scale indicating a bordering upon the feeble-mindedness to that indicating genius or near genius. There was no evidence that the increased enrollments of the schools were enlarging the range of intelligence in the junior high school, although there was ample evidence that it was increasing appreciably the number of pupils in the lower intelligence groups.

In achievement, also, wide differences were found. In a single grade differences amounting to eight grades of progress were found to exist between pupil achievement extremes in some subjects. There was evidence that differences in achievement tended to increase in the later grades.

A large variation in pupils' tastes, interests, and aptitudes was also shown extending from preferences for certain subjects to participation in outside work and future school plans.

An examination of the environment and background of pupils showed a wide variety of home conditions, great diversity in the occupational status of the parents, a somewhat smaller variation in nationality of parents, and various other differences dependent upon these factors.

Such wide differences, especially in ability, demonstrated the need of special techniques for their recognition. Of the various means employed for this purpose

¹Terman, Lewis M. The Measurement of Intelligence. New York. Houghton, Mifflin and Co. 1916.

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ability grouping was found to be most frequently used. Evidence was presented in an attempt to show that ability grouping has been recognized as an efficient means of providing for individual differences.

A study of the bases used in forming ability groups revealed that among single bases, elementary school teachers' estimate of capacity, fifth and sixth grade marks, and sixth grade marks have been found most accurate for sectioning pupils according to ability. Intelligence quotients, or mental test scores were also found to be reliable. Combinations of bases were shown to be more accurate than single bases for this purpose. The combinations of (1) elementary school teachers' estimates of pupils' capacity and intelligence quotients or composite scores from group mental tests, (2) elementary school teachers' mark and intelligence quotients and (3) sixth grade marks and intelligence quotients have been found most accurate of all in forming ability groups. Sixth grade mark and intelligence quotients are more reliable than fifth-sixth grade marks and intelligence quotients.

The attitudes of most junior high school administrators was found to be favorable to the use of ability grouping. The evidence available tended to show also that most pupils were not averse to the practice. There was some evidence that parents were favorably disposed to the use of the plan.

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An analysis of studies regarding practices showed that improved methods of sectioning pupils have been adopted by most junior high schools. The trend seems to be away from a rigid presentation of subject matter to all groups toward adaptation of the materials and instructional procedures to the needs and abilities of the group.

In conclusion, this study has dealt with the plan of ability grouping as a means of recognizing individual differences without particular regard to various other plans that have also been proposed and are being used for this purpose. Comparison of this plan with that of heterogeneous grouping has, the writer believes, demonstrated the superiority of the former in the modern educational scheme. It is not contended that it is a perfect plan. Indeed, even its most ardent supporters admit its imperfections, especially if the plan is not intelligently and impartially administered. The testimony of administrators, the opinion of educational authorities, formed from observation and experimental studies of the plan in practice, and, above all, the wide-spread use that has been and is being made of the plan as a means of recognizing the individual differences found among the population of our junior high schools testify to its effectiveness. Educational practice is a constantly changing, constantly evolving system ever adapting itself to the needs of the times. Perhaps in the future some individual study plan such as the Dalton or Winnetka plans may be found more practicable and

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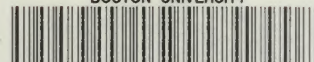
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